SOUND DEVICES

788T

High Resolution Digital Audio Recorder with Time Code
User Guide and Technical Information
firmware rev. 1.51

SATA 2.5" HDD

CF UDMA

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TIME CODE

USB 2.0

FireWire 400 / 800

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Welcome

Thank you for purchasing the 788T. The ultra-compact 788T records and plays back audio to and from its internal hard drive, CompactFlash, or external drives, making field recording simple and fast. It writes and reads uncompressed PCM audio at 16 or 24 bits with sampling rates between 32 kHz and 48.048 kHz. The time code implementation makes the 788T ready for any recording job—from over-the-shoulder to cart-based production.

The 788T implements a no-compromise audio path that includes Sound Devices' high-performance microphone preamplifiers. Designed specifically for high bandwidth, high bit rate digital recording, these preamps set a new standard for frequency response linearity, low distortion performance, and low noise.

With documentary and ENG mixing engineers in mind, the 788T is very small, while still being feature-rich. No other recorder on the market matches its size and feature set. In addition, its learning curve is quite short—powerful does not mean complicated.

Sound Devices took advantage of the best in professional and consumer electronic technologies to bring incredible feature depth with ease of use. Hard drives and CompactFlash are highly reliable, industry standard, and easily obtainable. With the ability to write to an external drive, low-cost, portable media can be delivered to post production. The removable, rechargeable battery is a standard Sony-compatible Li-ion camcorder battery pack. The 788T interconnects with Windows and Mac OS computers for convenient data transfer and backup.

788T Firmware Known Issues

For a complete list of any known issues: sounddevices.com/download/788t-firmware.htm.

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Quick Start Guide

The 788T is an extremely powerful and flexible portable digital audio recorder. Before recording, please familiarize yourself with the product. Several settings should be verified or set based on individual recording needs.

Powering the Unit

1. Apply power to the unit by attaching the (included) removable, rechargeable Li-ion (Lithium Ion) battery to the back panel battery mount. The metal tabs on the mount line up with the electrical contacts on the battery. From the factory, the battery may not have a charge, so external DC may be needed for initial operation and charging. Connect the (included) XL-WPH2, AC-to-DC power adapter to the DC input plug to power and charge the battery.
2. Press and hold the PWR POWER key for one second to turn the unit on. Press and hold the POWER key for one second to turn the unit off.

If this is the first time the recorder has been powered, the date and time may need to be set.

Charge the included Li-ion battery for 6 hours prior to initial use.

Menu Navigation Basics

The Setup Menu provides options for recording, routing, and control of parameters. The single layer menu structure allows for very quick navigation and selection of functions. To enter the Setup Menu press the front panel MENU MENU key. Once in the Setup Menu, the following conventions are shared for navigating among selections and to select specific parameters.

- MENU - The MENU key enters the Setup Menu
- `>ITEM<` - Highlighted menu item
- ✔ - Check Mark (TONE key) selects the highlighted item or parameter
- ↑ - Up arrow (MENU MENU key) moves up in menu and between menu parameters
- ↓ - Down arrow (HDD HDD key) moves down in menu and between menu parameters
- ✘ - X (LCD Backlight key) exits the selected menu or the Setup Menu altogether
- The ■ STOP key exits from any menu, cancels any changes, and escapes all Setup Menus.

The Multi-Function Rotary Switch (labeled “Select”) is a convenient control to quickly navigate among menu items and item options. Its push-to-select function duplicates the check mark in most menus.

Connecting Audio Sources

1. Connect audio sources, either analog or digital, to the appropriate input connector.
2. When using either input, set the appropriate input level to mic, line, or digital, in the Input Settings Window. Move and hold the Input Selector Switch toward the respective input to access the Input Settings Window.
3. If Mic-level inputs are used on XLR inputs 1-4 or TA3 inputs 5-8, make certain that phantom power, input limiters, and high-pass filters are activated in the Input Settings Window as required.

Routing Inputs to Tracks

Before recording, inputs **must** be assigned to tracks. Each of the 788T's eight inputs (1, 2, 3, 4, 5, 6, 7, 8) can be assigned to any of the eight tracks (Left, Right, A, B, C, D, E, F). Any of the eight inputs can have its own isolated track, multiple inputs can be summed to the same track, or an input can be routed to multiple tracks.

1. Press and hold the ■ STOP key then press the INPUT key to cycle through factory routing presets. The 788T has six often-used presets for quick setup of input-to-track routing combinations.
2. If none of the preset routing combinations are suitable, assign a custom routing. Sequential presses of the INPUT key will eventually cycle to the custom routing option. *See Input to Track Routing*. From the custom input routing menu any input can be assigned to any track, including multiple inputs assigned to a single track.
3. Press **EXIT** to leave input routing mode.

If no input is assigned to a track the 788T will not record.

Selecting Recording Parameters and File Destination

For most productions, the general recording parameters of bit depth, sampling rate, media selection, and file format are infrequently changed. Enter the Setup Menu to verify recording settings. Bit depth and sampling rate are displayed on the LCD panel.

1. Select the bit depth as needed in the Setup Menu option **REC: BIT DEPTH**.
2. Set the sampling rate as needed in the Setup Menu option **REC: SAMPLE RATE**.
3. Select the file type, WAV mono or WAV poly in the Setup Menu option **REC: FILE TYPE**.
4. Select the storage media to be recorded to (Internal hard drive, CompactFlash, External drive, or any combinations of the three drives) in the Setup Menu option **REC: MEDIA SELECT**.

Time Code Setup

When using a time code workflow, proper time code setup is essential for accuracy. Skip this section if time code is not being used.

1. Select the appropriate time code frame rate in the Setup Menu option **TIMECODE: FRAME RATE**.
2. Select the appropriate time code mode in the Setup Menu option **TIMECODE: MODE**.
3. Determine whether the 788T is to be the time code master or slave. Set time code parameters accordingly to ensure all recording equipment is using the same time reference. *See Time Code for additional information on time code setup.*

Recording

With the file parameters set, you are ready to begin recording. The 788T is a record-priority device—pressing the REC RECORD key cancels all functions, except file-based operations, and immediately begins recording a new file. To confirm the 788T is actively recording, the Record LED, REC key, and the LCD backlight all illuminate red. The filename on the LCD display shows the currently recorded file. Press and hold the ■ STOP key to end recording.

Playback

When recording is stopped, the most recently recorded file is immediately available for playback. Press the ► PLAY key to begin file playback from the beginning of the file. When the 788T is in Playback mode the LCD backlight will illuminate green.

To select a file for playback:

1. Press and hold the (HDD) key to select a drive for playback. The playback source is the storage volume highlighted on the LCD display. The last file recorded is the default file ready for playback.
2. Press the (HDD) key to access the Take List, press the (HDD) key again to access the Drive Directory.
3. Use the Multi-Function Rotary Switch to navigate through the Drive Directory (File Viewer).
4. Once a file is highlighted, press the ► PLAY key to begin playback.

When playback has finished, the filename will begin flashing. Use the » FAST FORWARD key or « REWIND key to step through files in the folder, or press the ■ STOP key to exit Playback.

File Transfer to Computer

Sound Devices strongly recommends shutting down equipment before connecting to or from any FireWire 400 device with a connection that carries power (6-pin). Reports have come to our attention of isolated problems when hot-plugging IEEE 1394a (FireWire 400) devices. (Hot-plugging refers to making connections when one or more of the devices—including the computer—is on.) When hot-plugging, there are rare occurrences where either the FireWire 400 device or the FireWire 400 port on the host computer is rendered permanently inoperable. From our experience, any FireWire 400 connection which carries power is susceptible to this type of damage. It is possible to connect a FireWire 400 connector upside down. This, too, may potentially damage the FireWire connection on the 788T, the computer, or both.

When connected via FireWire 400 (IEEE-1394a), FireWire 800 (IEEE-1394b), or USB to a Mac OS or Windows OS computer (*See Specifications for computer requirements*), the internal hard drive and CF card mount onto a computer as "letter" accessible mass storage volumes. Use the appropriate cable for interconnection. Files on the 788T can be treated as if they are local files, including renaming files, copying, deleting and playing directly from the 788T hard drive.

In general, it is good practice to copy audio files from the 788T to a computer before any processing is performed on the files.

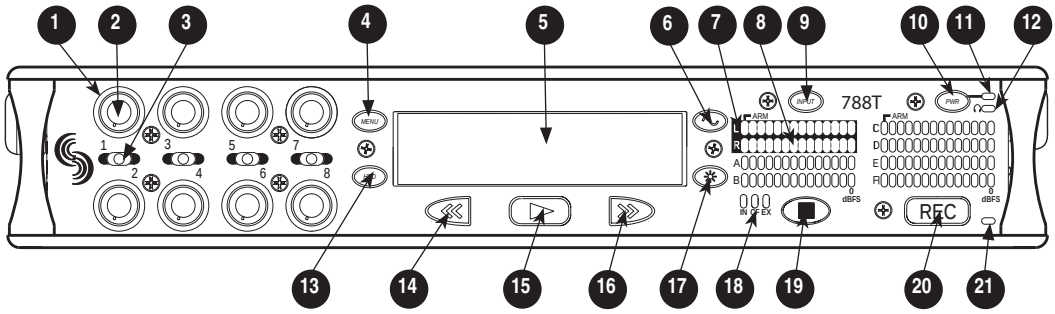
To connect the 788T for file transfer to computer:

1. Stop all playback and recording activity.
2. Make certain the 788T battery is fully charged, or connect to external DC.
3. Connect the 788T to the host computer with a FireWire 400, FireWire 800, or USB cable. No drivers are required if the computer meets the requirements listed in Specifications
4. If connecting to a computer and the 788T does not automatically connect, it is necessary to initiate connection to the computer by accessing the **FIREWIRE/USB: CONNECTION** Setup Menu option or by simultaneously pressing the ■ STOP and (HDD) HDD keys.
5. The 788T will enter FireWire/USB transfer, indicated by **FIREWIRE/USB: CONNECTION** on the LCD display. All menu and disk access functions of the 788T are stopped while the 788T is connected to a computer.
6. Navigate to either the hard drive or CF card from the computer and copy all needed audio files to local storage on the computer.

To avoid any possible directory corruption on the 788T, do not interrupt the connection process and always properly dismount the drives from the operating system. On Mac OS platforms, drag the drive icons to the trash. On Windows platforms, use the "Disconnect External Media" icon in the system tray.

Front Panel Descriptions

All 788T settings can be accessed and monitored through the front panel LCD and navigation keys. This allows the unit to be placed in a production bag along with field mixers and wireless transmitters and receivers.



1) **Input Activity Ring LEDs**
The LEDs surrounding the Input gain pots indicate the input activity for each input, respectively. The LEDs illuminate in various colors and intensities to represent the state of each input.
See Metering and Display.

2) **Input Gain Pots**
Controls the analog and digital input gain (input trim) of each channel respectively.
Input Gain Pots can be switched to the off position to mute the input and unroute it from its designated track. This ultimately extends battery life. Defeat in-active inputs by turning the knob full counter-clockwise (off) position. *See Input Setup and Control*

3) **Input Selector/Solo Switch**
Selects odd numbered inputs when pushed left and even numbered inputs when pushed right. Selecting an input using the Input Selector/Solo Switch will solo the selected input in the headphone monitor and display the Input Settings Window for as long as the Input Selector Switch is held in position. *See Input Setup and Control*

4) **MENU Key**
Accesses the 788T Setup Menu. When in the Setup Menu use the MENU key to move up through the options and parameters.

5) **LCD Display**
Primary display of 788T status. The LCD is backlit using the LCD backlight key. When the backlight is active the backlight color can be set to indicate the recorder's current mode.
Red = Recording Mode
Green = Playback Mode
White = Standby Mode

6) **TONE key**
Press and hold to activate the tone oscillator. Frequency, tone level, and routing are controlled in the Setup Menu. When in the Setup Menu use the TONE key to enter Setup Menu options and select parameters when the check mark appears in the upper right hand corner of the LCD.

7) **Track Arm LEDs**
A solid blue LED indicates that the respective track has at least one input routed to it.

8) **Level Meter LEDs**
Eight, 13-segment track level-meters indicate level in dBFS. Metering ballistics and peak hold times are selected in the Setup Menu.

9) **INPUT Select Key**
Press and hold the STOP key then press the Input key to access the Input: Track Routing Setup Menu. Cycle through factory and custom routings by pressing the Input key while holding the STOP key. See *Input-to-Track Routing*

10) **Power Key**
To power up the unit, press and hold the Power (PWR) Key for about one second. To power the unit down, press and hold the Power Key for about one second.

11) **Power/Charge LED**
Indicates the 788T is powered and available for operation. Indicates the charge status of the onboard battery charger.

12) **Headphone Output Peak LED**
Indicates overload of the headphone amplifier. When lit, the headphone circuit is overloading. Reduce headphone level.

13) **HDD Key**
Press to enter the Take List and Drive Directory. From the Take List, view and edit metadata across all storage mediums. From the Drive Directory navigate between storage media, folders, and files. View folder and file properties and select files for playback.
The media that is selected for playback is shown on the left hand side of the root level page. Press and hold the HDD key to toggle between available media. If only one media is present, media toggle is disabled. When in the Setup Menu use the HDD key to move down through the options and parameters.

14) **Rewind Key**
Performs reverse (REW) scrubbing through the played file when pressed in playback and play-pause mode. Play-pause indicated by flashing A-time on LCD. Reverse playback rate increases the longer the key is held. In play-stop mode (indicated by flashing filename on LCD) selects the previous file in the record folder (either daily folder or main folder).

15) **Play Key**
Plays back the file displayed in the LCD. If pressed immediately after recording is stopped, the most recently recorded file is played back.

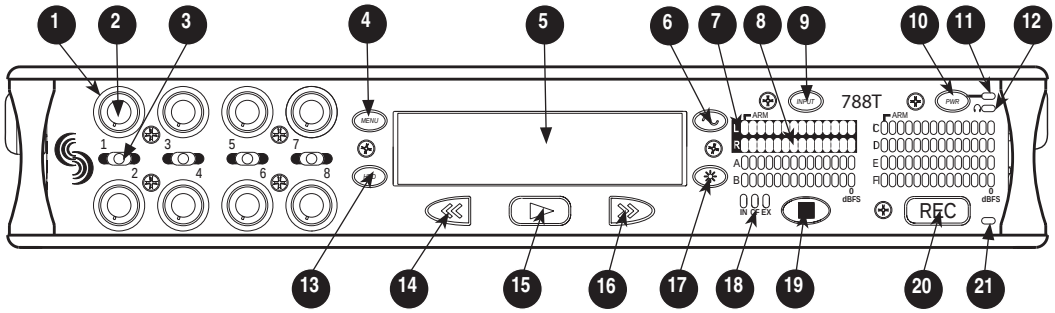
16) **Fast-Forward Key**
Performs fast-forward (FF) scrubbing through the played file when pressed in playback and play-pause mode. Play-pause indicated by flashing A-time on LCD. Fast forward rate increases the longer the key is held. In play-stop mode (indicated by flashing filename on LCD) selects the next file in the record folder (either daily folder or main folder).

17) **LCD Backlight Key**
Press to toggle the LCD and Front Panel soft key backlighting. Hold the LCD Backlight key and turn the Multi-Function Rotary Switch to adjust the brightness of LEDs. In the Setup Menu the LCD Backlight key functions as the cancel and exit key.

18) **Media Activity LEDs**
Indicates storage media activity. IN (internal hard drive), CF (CompactFlash), EX (external FireWire device). The LED illuminates green when the storage media is ready, illuminates yellow when the storage media is writing/reading and while connected to a computer, and illuminates red when the storage media has encountered an error, if the drive has less than one minute of recording time left, or when running the Drive Repair utility.

19) **Stop/Pause Key**
Momentarily press and hold this key to stop recording. In playback mode, a single press pauses playback (play-pause), allowing audio scrubbing with the FF and REW keys. Another press of the key enters play-stop mode where the FF and REW keys select files for playback from the current directory, the filename and time display flash to indicate that a new file has been selected. One more press of the key exits playback mode.
Pressing the STOP key whilst in stop mode displays the name of the next file to be recorded in the LCD. In the Setup Menu the STOP key is also used to exit from any menu, returning to the main display.

Front Panel Descriptions cont.

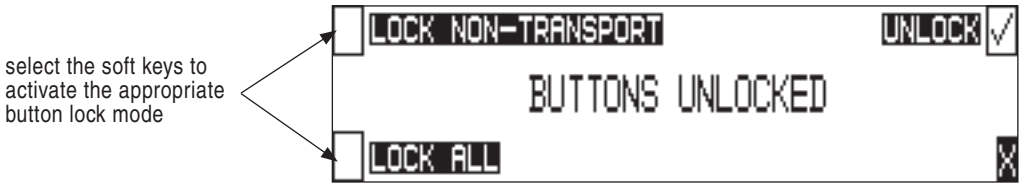


20) **Record Key**
Press to begin recording. The 788T is a record-priority device; pressing this key starts recording and discontinues all other functions, except file operations. The REC key will illuminate red when the 788T is actively recording. If the selected storage media is not ready to begin recording a new file, the REC key will flash red until the recording has begun. Pressing the REC key during recording can set a cue marker, start a new file, as selected in the Setup Menu.

21) **Record LED**
Illuminates red when record mode is active.

Panel Lock

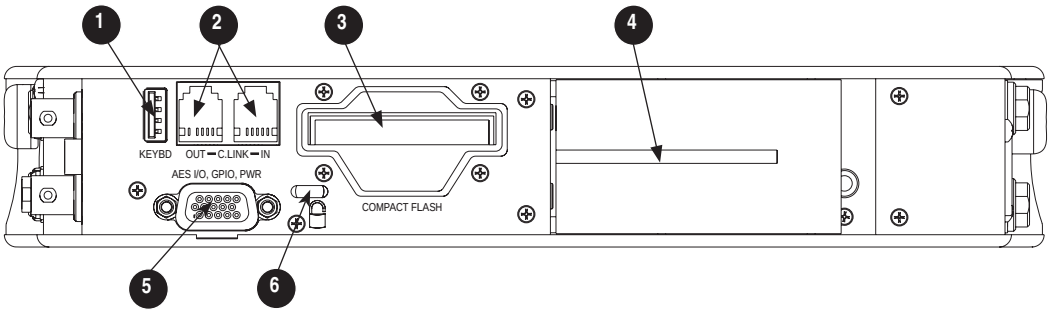
Press and hold the LCD backlight key then the TONE key to bring up the front panel Button Lock Screen. Button lock prevents unintentional setting changes and/or record status. The 788T displays any button lock options currently enabled.



There are three modes:

- **Unlocked** – all keys are accessible and operate normally.
- **Non-Transport Lock** – All front panel controls are locked except the Record, Stop, Play, Rewind and Fast Forward keys.
- **Lock All** – All front panel keys are locked except the REC key. The REC key is kept active so the user can initiate recording after entering this mode and enter cue markers. To stop recording in this mode, you must disengage the panel lock and press the stop key.

Back Panel Descriptions



1) **USB Keyboard Input**
USB A Female Connector for USB keyboard use only. A keyboard can be used to remote control the 788T and enter metadata.

2) **C. Link In/Out**
6-pin modular ("RJ-12") connectors. Not a telephone jack! For connection to CL-1 Keyboard and Remote Control Interface.

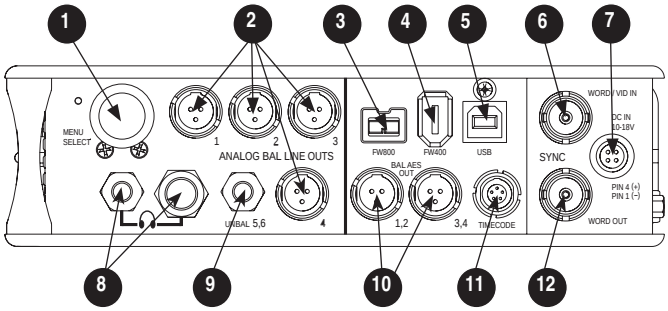
3) **CompactFlash Slot**
Accepts CompactFlash media with the label-side up. Compatible with Type I, Type II, and MicroDrives.

4) **Battery Mount**
Accepts Sony® InfoLithium L-Series batteries. Also accepts batteries conforming to this mount. Numerous capacities, from 1500 mAh to 7000 mAh are available.

5) **Multi-Function DE-15 Connector**
Multi-function DE-15 connector acts as AES3 Inputs 1-8, AES3 Outputs 5-6, and Logic In and Out. Analog and digital inputs can be used simultaneously. *See Connector Pin Assignments.*
Sample Rate Converters are enabled on each AES input when Setup Menu **REC: SYNC SOURCE** is set to Internal. *Sample Rate Converterts.*
AES inputs support AES42 Mode 1 operation, supplies +10 V of digital phantom power. *See AES42 Digital Microphones.*

6) **Security Slot**
Compatible with the Kensington® Security Slot specification. Used to secure the recorder to a fixed object with a compatible computer lock.

Right Panel Connectors and Controls



1) **Multi-Function Rotary Switch**
When in the Setup Menu, the rotary switch moves between menu selections; push to enter selection or enter data. In Record and Playback modes, selects headphone monitor source; press action is user selectable. Turn the knob while holding the LCD Backlight key to adjust the brightness of LEDs.

2) **TA3 Analog Outputs 1-4**
Active-balanced, analog outputs 1-4. Program source and attenuation levels are user selectable. Pin-1 ground, pin-2 (+), pin-3 (–). When connecting to an unbalanced input, do not connect pin-3.

3) **FireWire 800 (IEEE-1394b) Port**
Connection to a computer (Mac OS, Windows) to access the internal hard drive and CompactFlash volumes as mass storage devices. Also used to attach external FAT32-formatted FireWire drives to the 788T for direct recording and copying.

4) **FireWire 400 (IEEE-1394a) Port**
Connection to a computer (Mac OS, Windows) to access the internal hard drive and CompactFlash volumes as mass storage devices. Also used to attach external FAT32-formatted FireWire drives to the 788T for direct recording and copying.

5) **USB-B Port**
Connection to a computer (Mac OS, Windows) to access the internal hard drive and CompactFlash volumes as mass storage devices.

6) **Sync Input**
This BNC is used to connect an external video sync or word clock reference signal for word clock purposes. Accepts NTSC, PAL, and Tri-level video syncs as well as word clock rates between 32 kHz and 48.048 kHz.

7) **External DC In**
Accepts power from 10–18 volts DC to power and charge the Li-ion battery. Hirose 4-pin connector is wired pin-1 negative (-), pin-4 positive (+). Pin-2 and pin-3 are not connected. Charging characteristics are set in the Setup Menu.

8) **Headphone Output**
1/4-inch and 3.5 mm TRS stereo headphone connectors. Can drive headphones from 8 to 1000 ohm impedances to very high levels. Tip = left, ring = right, sleeve = ground.

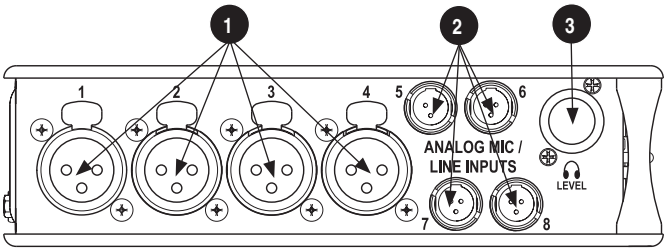
9) **Analog Output 5-6**
Unbalanced output on 3.5 mm TRS stereo connector. Program source and attenuation levels are user selectable. Tip = left, ring = right, sleeve = ground.

10) **AES3 Output 1-2 and 3-4**
Transformer-balanced AES3 digital outputs 1-2 and 3-4. Program source is user selectable.

11) **Time Code Multi-Pin**
Time code input and output on 5-pin LEMO® connector.

12) **Word Clock Output**
Provides a word clock output running at the sample rate of the 788T.

Left Panel Connectors and Controls

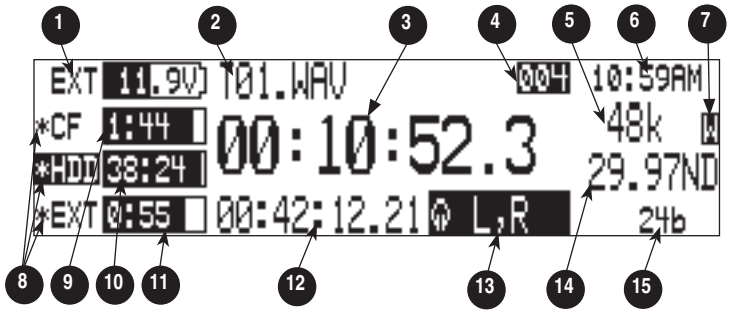


1) **XLR Analog Inputs Channels 1-4**
Active-balanced analog microphone- or line-level input for inputs 1-4 on XLR connector. Input type is set within the Input Settings Window. Pin-1 ground, pin-2 (+), pin-3 (–).

2) **TA3 Analog Input Channels 5-8**
Active-balanced analog microphone-or-line-level input connector for inputs 5-8. Input type is set within the Input Settings Window. Pin-1 ground, pin-2 (+), pin-3 (–).

3) **Headphone Volume**
Adjusts the headphone volume. NOTE: the 788T is capable of producing ear-damaging levels in headphones. Please use with caution

LCD Display Descriptions



1) **Battery/Voltage Level Indicator**
Indicates voltage level of the removable battery or external power sources. If present, external power overrides battery power. Graphical bar for relative level and numeric indicator for precise voltage measurement.

2) **File Name Display**
Shows file name actively being recorded or played back. In Playback-Stop mode, flashing file name indicates that the Fast-Forward and Rewind keys can be used to step through files in the current playback directory.

3) **Absolute Time (A-time) Display**
Shows the elapsed time of the file being recorded or played back in hours, minutes, seconds, and tenths. The A-time and the time code display can be exchanged if a large time code display is needed. This display can be set to reverse or flash while recording. Flashes in playback-pause mode.

4) **Cue Marker Display**
In Record mode, indicates when cue markers are set. Markers set by pressing the REC key (option must be selected in Setup Menu). In Playback mode, displays cue points numerically as they are reached in a file.

5) **Sample Rate Indicator**
Displays the set record sampling rate. In Playback mode, displays the currently selected file's sampling rate.

6) **Time & Date Display**
Alternating display between the set date and time of the 788T. This information is written as the creation and modification date for generated audio files.

7) **External Digital Clock Indicator**
This display will show when the 788T is locked to a valid external sync source, sync reference is user-selectable in the Setup Menu. The display will indicate the current valid sync source
D = digital input, W = word clock, V = video. The display currently shows that the recorder is successfully locked to a valid word clock source.

8) **Media Descriptors**
For all three media types, an asterisk in front of the media descriptor indicates which media is selected for record. Highlighted media descriptor indicates media selected for record monitoring, playback or file directory display.

9) **CompactFlash Status (space remaining/record ready)**
Bar graph indicates the remaining record time available on the CompactFlash media. Numbers show time in hours and minutes based on the presently selected number of record tracks, sample frequency, and bit rate.

10) **Internal Hard Drive Status (space remaining/record ready)**
Bar graph indicates remaining record time available on the internal hard drive. Numbers show time in hours and minutes based on the presently selected of number of record tracks, sample frequency, and bit rate.

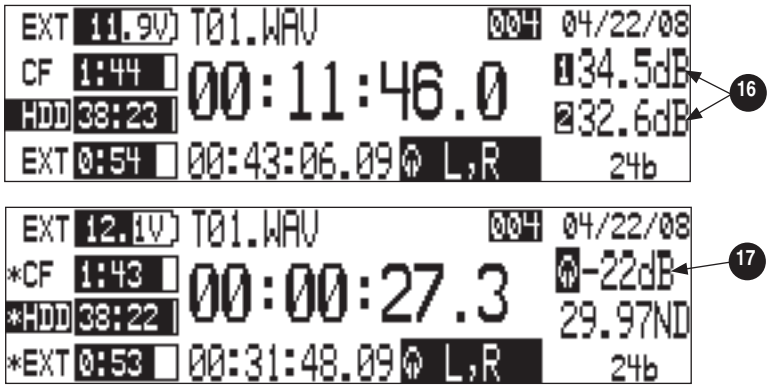
11) **External Media Space Status (space remaining/record ready)**
If a drive is not attached the indicator shows dashes. Bar graph indicates remaining record time available on the external FireWire volume. Numbers show time in hours and minutes based on the presently selected number of record tracks, sample frequency, and bit rate.

12) **Time Code Display**
In Stop and Record modes, displays the time code generated or received by the 788T. In Playback mode, displays the the time code information of the file currently selected for playback (if available). If non-time code files are playing, the display shows dashes. The time code display can be exchanged with the A-time display in the Setup Menu.

13) **Headphone Source Display**
Indicates the source for headphone output. Sources and selection order are user selectable in the Setup Menu.

14) **Time Code Frame Rate**
Displays the set time code frame rate. If a file has time code information embedded, the playback frame rate is indicated. If external time code is connected and the external rate differs from the rate set internally, the display will flash.

15) **Bit Depth Indicator**
Shows the set record bit depth. In playback, shows the file bit depth.

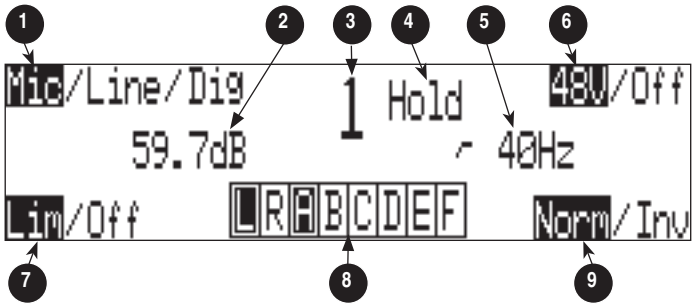


16) **Input Level**
When input gain is adjusted, gain level is indicated in dB for the input being adjusted and its neighboring input. The relationship of inputs is configured in the following manner and cannot be altered 1,2 / 3,4 / 5,6 / 7,8. Neighboring inputs are not linked or grouped unless specifically linked in the Setup Menu. Mic input gain range is from 0 dB to 76 dB, Line input range is from -25 to 50 dB and Digital input range is from -25 to 50 dB.

17) **Headphone Gain Level**
When the headphone gain is adjusted, this will appear and indicate the gain level in dB.

Input Settings Window Descriptions

To access the Input Settings Window press and hold the Input Selector Switch into the position of the desired input. Pushing the Input Selector Switch to the left will select the odd numbered inputs and pushing it to the right will select the even numbered inputs. Release the Input Selector Switch to return to the previously displayed screen.



1) **Input Type**
The highlighted selection indicates current Input Type. Input Type is selectable from Mic, Line, and Digital Inputs for each channel respectively. Toggle through Input Type selections by pressing the MENU key.

2) **Input Gain Display**
The Input gain is displayed in dB for the selected input.

3) **Input Selected**
Displays the Input that has been selected.

4) **Headphone Monitor Hold Indication**
Toggle and hold the Input Selector Switch for five or more seconds to latch Input Soloing. To exit the Input Soloing select another input with the Input Selector Switch or rotate the Multi-Function Rotary Switch.

5) **High-Pass Filter**
Indicates the state of the High-Pass Filter and the cut off frequency selected. Control the High-Pass Filter by using the Multi-Function Rotary Switch.

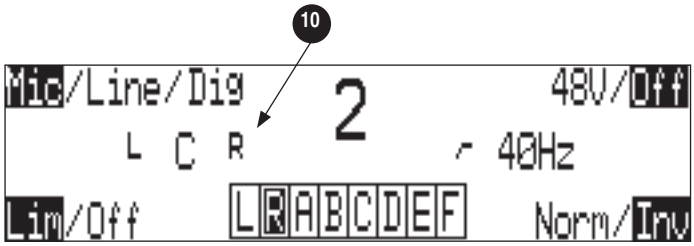
6) **Phantom Power**
The highlighted selection shows the current state of phantom power (48 volts) for the selected input. Enable or disable Phantom Power by using the Tone key.

7) **Input Limiter**
The highlighted selection shows the current state of the Input Limiter for the selected Input. Enable or disable the Input Limiter using the HDD or Rewind key.

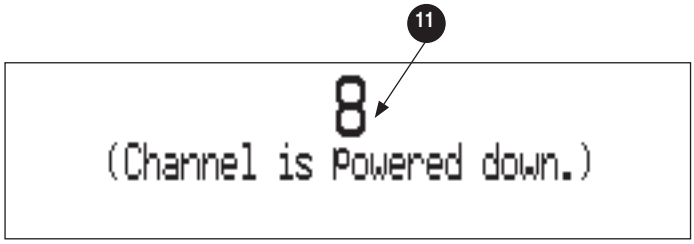
8) **Track Assignments Control**
The highlighted selection(s) indicates the track(s) that the selected input is currently routed to. To enter and exit the Track Assignments Control press the Play key.

9) **Polarity**
The highlighted selection shows the current state of the Input's Polarity. Control polarity using the LCD Backlight or Fast Forward key.

The following screen appears if the select Input is linked as a stereo pair.



The following screen appears if the select Input gain pot is switched to the Off position.

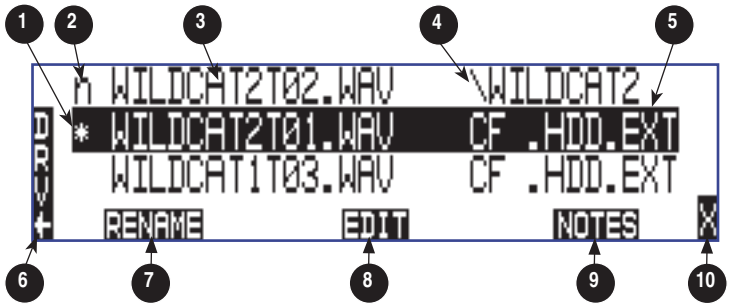


10) **Panning Control**
If the Input selected is a linked stereo pair, the odd numbered inputs will display gain and the even numbered inputs will display the stereo image.

11) **Channel Is Powered Down**
The Input Settings Window cannot be accessed if the Input's Gain Pot is switched to Off.

Take List Descriptions

To access the Take List press the HDD key or select Setup Menu option **FILE: VIEW TAKE LIST**. From the Take List view and edit metadata across all storage mediums.



1) **Current/Last Take**
The * indicates the current take being recorded or the last take to have been recorded by the 788T.

2) **Next Take**
The n indicates the name of the next take to be recorded. With the n take highlighted the user can make notes entry or increment/decrement Scene and Take for the next file to be recorded.

3) **Take Name Column**
This is a sequential list of Takes recorded by the 788T firmware revision 1.5+.

4) **Next File Destination**
Displays folder destination for the next Take to be recorded.

5) **Additional File Information**
Displays additional file information, the following information can be toggled through by pressing in on the Multi-function Rotary Switch: Beginning Time Code Stamp, Time of File Creation, Date of File Creation, Scene Names, Drives Containing the File, and Folder that Contains the File.

6) **DRV (Drive Directory)**
Press the soft Drive (HDD) key to access the Drive Directory (File Viewer).

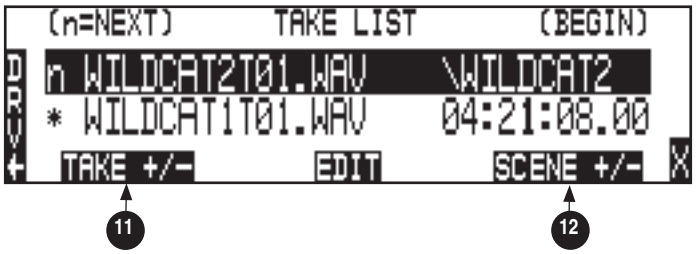
7) **RENAME**
Press the soft RENAME (Rewind) key to access the file/metadata rename window.

8) **EDIT**
Press the soft EDIT (Play) key to access the Take Edit Menu. From this menu, make notes entries and view/edit the following metadata at anytime for any take: Notes, Rename, Circle, Project, Scene, Take, Tape (Roll), Set/Clear Copy, Delete (sends file to the Trash), and Rename Tracks.

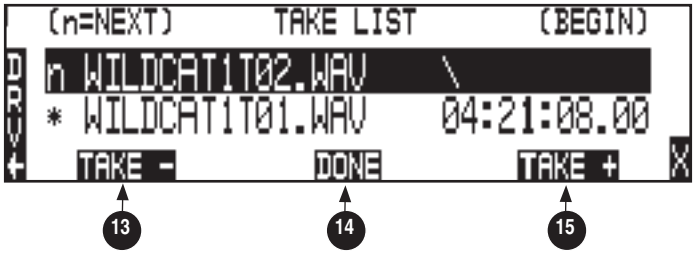
9) **NOTES**
Press the soft NOTES (Fast Forward) key to quickly access the Notes field.

10) **X Exit**
Exits to the previously viewed window.

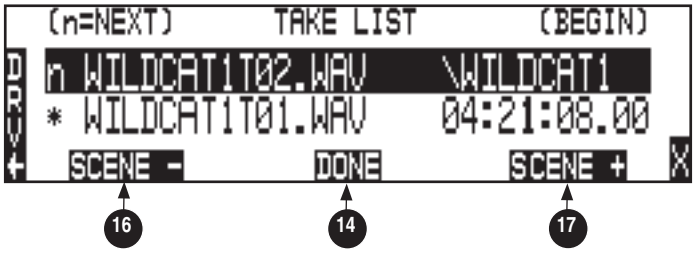
The following screen appears if the next (n) file is highlighted.



The following screen appears if Take +/- (11) is selected.



The following screen appears if Scene +/- (12) is selected.



11) **Take +/-**
Appears when the next take, indicated by the "n" is highlighted. Pressing the soft Take +/- (Rewind) key will access the Take increment or decrement options.

12) **Scene +/-**
Appears when the next take, indicated by the "n" is highlighted. Pressing the soft Scene +/- (Fast Forward) key will enter the Scene increment or decrement window.

13) **Take -**
Appears when the Take +/- is selected. Pressing the Take - (Rewind) key will decrement the take number. If the take number is decremented to match the name of the last file recorded, the False Take prompt will appear.

14) **Done**
Pressing the soft DONE (PLAY) key saves the increment/decrement settings for the next take to be recorded.

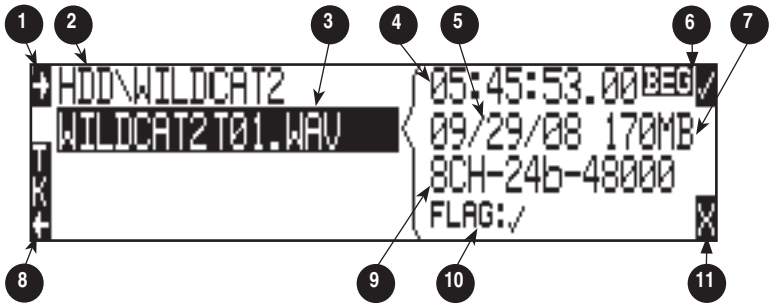
15) **Take +**
Appears when the Take +/- is selected. Pressing the soft Take + (Fast Forward) key will increment the take number.

16) **Scene -**
Appears when the Scene +/- is selected in the above window. Pressing the Scene - (Rewind) key will decrement the scene.

17) **Scene +**
Appears when the Scene +/- is selected. Pressing the soft Scene + (Fast Forward) key will increment the scene. Scenes will be incremented with either alpha characters or numeric digits, depending on the setting for Setup Menu option **REC: SCENE INCREMENT MODE**.

Drive Directory (File Viewer) Descriptors

To access the Drive Directory press the soft DRV (HDD) key from within the Take List. Press the HDD key twice from the main screen for quick access to the Drive Directory. To return to the Take List from the Drive Directory, press the TK soft (HDD) key.



1) **Root Directory**
Press to quickly access the Root Directory. From the Root Directory navigate between media or perform drive functions via the Drive Options Menu.

2) **Directory Path**
Indicates the directory path for the file/folder currently being viewed.

3) **Selected File**
Scroll through polyphonic and monophonic files using the Multifunction Rotary Switch. The highlighted file will display file properties and additional file information. Press play to immediately playback the select file.

4) **Additional File Information**
Displays additional information of the currently selected file. The information displayed is determined by the state of the File Information Toggle (6).

5) **Time and Date**
Display toggles between date of file creation and time of file creation for the highlighted file.

6) **File Information Toggle**
Press to toggle the type of information displayed in the Additional File Information field (4). The following information is displayed.
BEG = Beginning Time Code Stamp, LEN = Length of File, USR = User Bits, FPS = Frames Per Second.

7) **File Size**
Displays the size of the currently selected file.

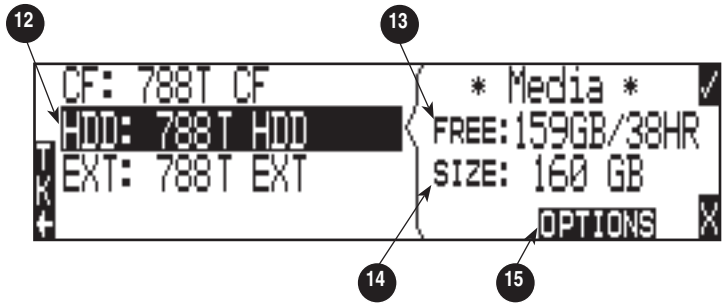
8) **Take List**
Press to access the Take List.

9) **File Properties**
Displays channel count, bit depth, and sampling rate of the highlighted file.

10) **Copy Flag Status**
Displays the status of the Copy Flags. Check marked files have Copy Flag set.

11) **X Exit**
Exits to the main screen.

The following screen appears if the Root Directory (1) is selected.



12) **Media Select**
Highlight desired media to view or perform drive functions.

13) **Free Space**
Displays the amount of free space available on the highlighted media. The time available is dependent on user setup.

14) **Media Size**
Displays the media size for the highlighted media.

15) **Drive Directory Options Menu**
Press the soft Options (Fast Forward) key to access the Drive Options Menu. The following drive functions are performed in the Drive Options Menu: Rename, Set/Clear Copy Flags, Empty Trash and False Takes, Erase (format).

Input Setup and Control

The 788T has eight inputs and eight record tracks. Inputs can be analog or digital sources. Analog inputs 1-4 use XLR connectors; inputs 5-8 use TA3 connectors. Digital AES3 inputs 1-8 use the DE-15 (D-Sub) connector.

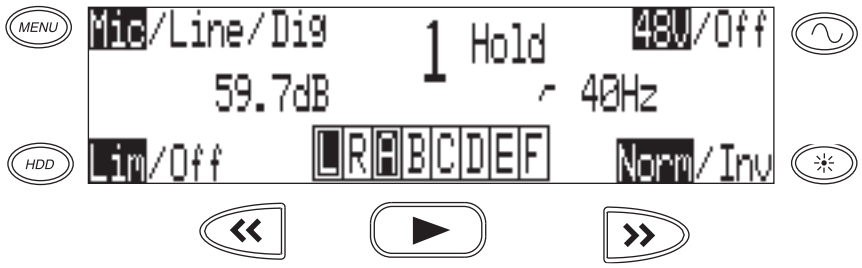
Analog and digital inputs can be used simultaneously.

Gain is controlled by the front panel Input Gain Potentiometers. They can be switched to the Off position to mute and power down the input and to ultimately extend battery life. Defeat inactive inputs by turning the Input Gain Pot to the full counter-clockwise (Off) position. The Input Gain Pots must be activated to route the respective input to a track and/or access the Input Settings Window.

Input Settings Window

From the Input Settings Window, view and/or change the following settings:

- Input Type
- Phantom Power
- Input Gain
- High-Pass Filter
- Input Limiter
- Track Routing
- Polarity



While in the Input Settings Window the selected input will be displayed in the center of the screen and the selected input will be soloed in the headphone monitor. The Track Arm LEDs illuminate to coorespond to the track routing.

If the Input Selector/Solo Switch is held for 5 or more seconds “Hold” will appear on the screen and the soloed input will remain in the headphone monitor until either another headphone monitor mode has been selected with the Multi-Function Rotary Switch or with the Input Selector/Solo Switch. Once the Input Selector Switch is released, the 788T will return to the previously displayed screen.

If the selected input is stereo linked, both of the inputs will be soloed in the headphone monitor.

Input Type

Select between Mic, Line, or Digital inputs using the MENU key while in the Input Settings Window.

Input Type	Input Connectors	Gain Range
Mic	XLR 1-4, TA3 5-8	Off (-infinity) 0 dB to 76 dB
Line	XLR 1-4, TA3 5-8	Off (-infinity) -25 dB to 50 dB
Digital	AES3 1-8 (D-Sub 15)	Off (-infinity) -25 dB to 50 dB.

Phantom Power

Phantom power (48 volts) can be activated individually, for each analog input. Enable or disable Phantom Power in the Input Settings Window using the Tone key.

Phantom power can be used for both mic- and line-level inputs. Using line-level inputs with microphones is useful in high SPL environments such as concert recording. Make certain to disable phantom power with Line-level output devices susceptible to damage from DC.

High-Pass Filters (microphone-level only)

High-pass filters on microphone inputs reduce sensitivity to low frequency signals. Pressing the Multi-Function Rotary Switch will engage or disengage the High-Pass Filter. Turn the Multi-Function Rotary Switch to select the cut off frequency in 10Hz steps from 40 Hz to 320 Hz.

Filter slopes of 6 dB and 12 dB per octave are selectable in the Setup Menu and will apply to all inputs where the high-pass filter have been engaged.

Input Limiters

Analog inputs incorporate an advanced, analog/DSP-controlled hybrid limiter to prevent input overload. In normal operation and with proper gain settings, the limiters should rarely engage. When activated, these limiters will prevent unusually high input signal levels from clipping the analog input stage of the preamp.

Limiter activity is shown by the Input Activity LEDs by illuminating yellow. The Input Limiters are active for both mic- and line-level inputs. Enable or disable the Input Limiters using the soft Lim (HDD) key while in the Input Settings Window. The 788T offers several adjustments for its peak limiter to tailor the sound to the user's desire: Threshold; Knee; and Recovery.

The Limiter Threshold adjusts the maximum peak level at which the limiter will engage. Sounds louder than this threshold are attenuated. This threshold is adjustable in the Setup Menu option **`INPUT: LIMITER THRESHOLD`** from -12 to -2 dBFS in .1 dBFS increments.

The Limiter Recovery adjusts how slowly the limiter brings its gain back up after a peak is limited. A shorter recovery follows the envelope of speech better than a longer recovery, but at the expense of low-frequency distortion. Recovery time is adjustable in the Setup Menu option **`INPUT: LIMITER RECOVERY`** from 50 msec to 2000 msec in 10 msec increments.

Setup Menu option **`INPUT: LIMITER KNEE`** allows the user to control whether the limiter has a Hard- or Soft-Knee. The hard knee setting leaves all program material below the threshold completely unaffected and attenuates only those peaks above the threshold. The soft knee setting attenuates the program material slightly before the threshold (about 6 dB) for a more gradual tape-like sound.

Inputs can have their limiters linked or grouped according to the Input Linking settings. This is ideal for working with stereo or surround sources. *See Input Linking.*

Polarity

Polarity inversion (sometimes referred as phase reverse) can be applied to both analog or digital inputs. This can be used to rectify incorrectly wired balanced cables, to prevent signal cancellation when a source is dual-miked from opposite directions, or reverse left/righ with MS microphones. Select between Normal and Inverse polarities using the LCD Backlight key.

Track Assignment Control

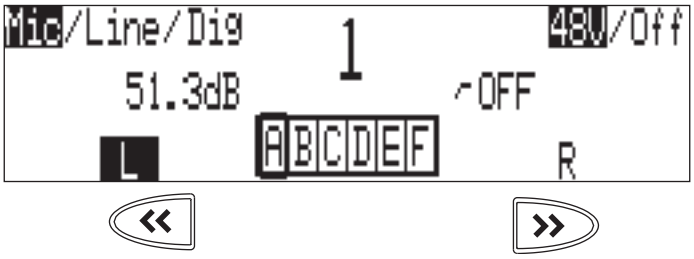
The Track Assignment Control allows the user to quickly view and edit the input-to-track routing for the selected input. The highlighted selections indicate the tracks that the input is currently routed to.

To edit track assignments:

1. Enter the Input Settings Window using the Input Selector Switch. The image below indicates that Input 1 is currently assigned to Track L.

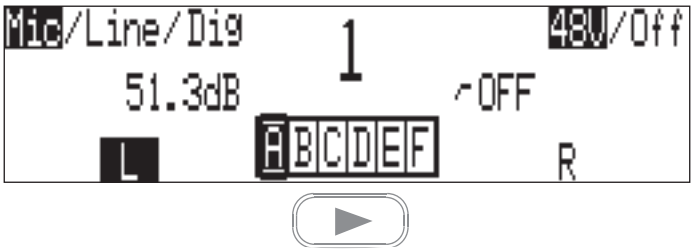
2. To make edits to the track assignments press the Play key.

3. Route or un-route inputs to Track L and Track R by pressing the Rewind and Fast-Forward keys respectively. Route or un-route Tracks A-F using the Multi-Function Rotary Switch. Scroll through the assignable tracks by turning the rotary switch. To route or un-route tracks, press in on the rotary switch.



4. The image below indicates that Input 1 is now routed to Track L, and to Track A. Once changes have been made, the settings will be saved in the **INPUT: TRACK ROUTING** Setup Menu option under the "Edited" routing selection.

5. To exit the Track Assignments Control and remain in the Input Settings Window, press the Play key.



6. The new track assignments will be visible from the Input Settings Window.

Analog Inputs

Analog inputs 1-4 on XLR connectors and analog inputs 5-8 on TA3 connectors, are the primary connections into the recorder. These inputs accept balanced or unbalanced mic- or line-level inputs. Gain is controlled by the front panel Input Gain Pots.

Input Linking (Stereo or MS Decoding)

Inputs 1-8 can be grouped or linked together to ensure that gain is applied evenly across all linked inputs. Linked or grouped inputs can also be muted and un-routed from tracks by using a single Input Gain Pot. Input settings such as Input type, Limiter, Phantom Power, and High-Pass Filters are also linked and will be applied across all linked inputs.

Neighboring inputs can be linked as stereo pairs in the following sequences: 1-2, 3-4, 5-6, and 7-8. When linked, the odd channel's front panel potentiometers control the signal level of linked inputs, and the even channel's front panel potentiometers control the left-to-right balance of the stereo pair.

When set to link as an MS pair, the inputs are decoded as MS stereo, where the gain and balance for the pair work the same as stereo linking above. The odd input is for Mid signal and the even input is for Side signal.

When linked, the Input Selector Switch will solo the linked pair in the headphone monitor. For example if Input 1 and Input 2 are linked as a stereo pair, pushing the Input Solo Switch will change the headphone monitor to 1,2 (Input 1 on the left-side and Input 2 on the right-side of the headphone monitor).

If MS stereo linking is selected for inputs, program sent to tracks and headphones will be L/R stereo program. To record discrete M and S signals, do not link for MS, but monitor the MS signal in headphones.

Digital Inputs

The 788T accepts AES3 (AES/EBU) balanced and AESid unbalanced digital signals in professional or consumer format via its DE-15 connector. The 788T will auto detect the type of digital signal and adjust accordingly. Digital input gain is controlled via the front panel potentiometers.

To use a digital input, the Input Type switch located in an input's Input Settings Window must be set to Digital. Although a digital input signal contains a pair of channels, the 788T is able to select just

one of the pair as an input, so for example, it is possible to select line or mic for Input 1 and digital for Input 2.

When recording from a digital input, it is important to sync the 788T's sample clock from a source that is synchronous with the digital input signal otherwise audio quality will be degraded. *See Synchronization.* The simplest way to achieve this is to set the 788T to derive its sample clock from the clock embedded within a digital signal. Go to the **REC: SYNC REFERENCE** Setup Menu and set the sync source to the applicable digital input pair.

The LCD will display 'D' when locked to the selected digital input. If the Input Activity ring LEDs are flashing, then a digital input is selected but no valid digital clock is being received.

AES42 Digital Microphones

The 788T is compatible with digital microphones conforming to the AES42 specification, such as the Schoeps CMD-2U. By setting **DIGITAL INPUT: AES42 POWER** to Enabled, the 788T supplies +10V of "digital phantom power" to each of the digital inputs. The gain of the microphone can be adjusted with the 788T's front panel gain control just like a normal analog microphone. The gain adjustment is controlled in the 788T digital domain.

The 788T can lock its sample clock to a single AES42 digital microphone signal. This is set from the Setup Menu option **REC: SYNC REFERENCE** to the corresponding digital inputs. When the 788T is set to use its internal clock any connected incoming AES3 or AES42 signal is sample rate converted.

Things to consider when using AES42:

- The 788T supports four AES42 pairs.
- Input Limiters can not be enabled for Digital Inputs.
- The 788T supports AES42 Mode 1 operation, Mode 2 operation is not supported. In other words, the 788T supports digital audio transfer via AES42. However, it does not support the AES42 protocol for remote control, microphone identification, or status flag indicators. Mode 2 microphones will automatically operate in Mode 1 when connected to the 788T.
- When using multiple AES42 microphones set the **REC: SYNC REFERENCE** to Internal. This will ensure a synchronous operation between the 788T and digital microphones.

Input Delay

A digital delay is selectable on each channel of the 788T. Delay time per input is selectable in tenths of a millisecond (0.1 msec) steps up to 30 msec. Each input has its own designated Input Delay Setup Menu. If an input is turned Off, its Input Delay Setup Menu is crossed out. Delay is not set until the Multi-Function Rotary Switch is pressed or the Check Mark (Tone) soft key is selected.

Input delay can be useful for time aligning input signals from differing sources. For example, digital wireless mics that have a processing delay in their outputs. In addition, all digital conversion stages have delay.

Input Muting

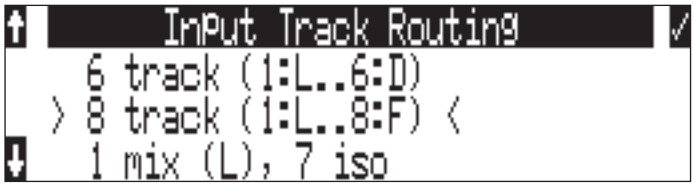
Input Gain Pots can be switched to the off position to mute the input and to un-route it from its designated track. Muting inputs deactivates associated circuitry and ultimately extend battery life. Defeat inactive inputs by turning the Input Gain Pot to the full counter-clockwise (Off) position. Input Activity LEDs for each respective input will remain off when muted. When an input is switched to off the Input Selector/Solo Switch for the respective input will be disabled. The 788T will not record if all Inputs Gain Pots are switched to Off.

Input to Track Routing

The 788T uses a flexible routing scheme to assign inputs and tracks for recording, any input can be routed to any recording track. Multiple inputs can be routed to a single track to create mono-mixed recordings or to a pair of tracks to create stereo-mixed recordings.

A solid blue LED next to the level meters on each track acts as a record arm indication. It indicates that at least one input is assigned to that record track. Consequently, if a track has only a single input routed to it and that input is muted by turning its input pot fully counter-clockwise, the track is disarmed and the blue track arm LED is extinguished.

Pressing the (INPUT) INPUT key brings up the following menu.

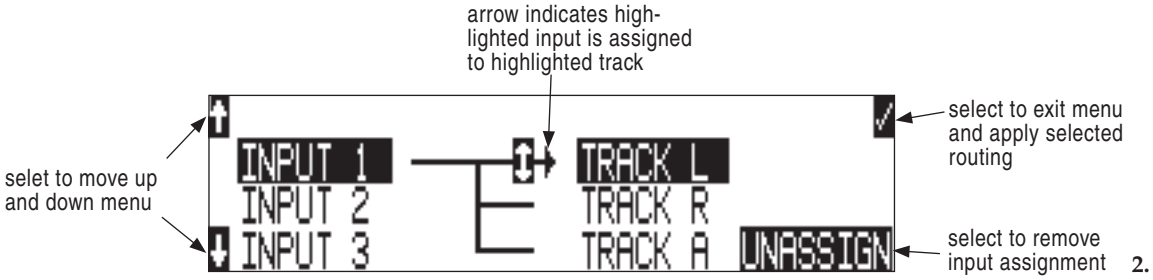


Routing

Hold down the Stop key then press the (INPUT) INPUT key to cycle through the preset input-to-track routing combinations. These presets are factory set and cannot be changed. The last three preset selections are **CUSTOMROUTE** options. Press the **EDIT** soft key to enter the custom routing menu. Custom routing allows any input to be assigned to any record track. In the menu, highlighted input and track combination are displayed in white text. The eight inputs are shown on the left; the eight record tracks are shown on the right.

To assign custom input routings:

1. Press the (INPUT) INPUT key until **INPUT TRACK ROUTING** is displayed on the LCD display.



2. Press the **EDIT** soft button ((✳)) and scroll to the appropriate input screen.
3. Using either the Multi-Function Rotary Switch or the up and down arrows, navigate to the desired input-to-track combinations.
4. When a chosen pairing is highlighted, press either the **ASSIGN** soft key or the Multi-Function Rotary Switch to assign the combination. Assigned tracks are noted on the screen by the addition of an arrow pointing to the record track.
5. Once a track is assigned, move to the next input-to-track combination desired.
6. To remove an input-to-track combination assignment, navigate to that combination and press the **UNASSIGN** (LCD Backlight) soft key or the Multi-Function Rotary Switch.
7. Exit and complete the assignment by pressing the Check Mark (Tone) soft key.

The Input Routing menu will always exit to the main screen whether entered from the INPUT key or the menu selection.

Sampling Rate and Bit Depth

The 788T generates uncompressed PCM audio WAV files in the Broadcast Wave File format at the user-selected sampling rate and bit depth. The 788T LCD displays the remaining available recording time based on the sampling rate, bit depth, number of assigned tracks, and the selected storage media's available capacity. *See Apendix A - Record Time Calculation.*

Sampling Rate

When a sampling rate is selected for recording, all tracks are recorded at the selected sampling rate. Sampling rates are selected among common rates from 32 kHz to 48.048 kHz. Additionally, non-standard sampling rates can be applied when the 788T is word clocked from an external source (clock sources between 32 kHz and 48.048 kHz). When recording off-speed sampling rates, files will be stamped with the rate closest to the internally generated frequency.

Sampling Frequency and Audio Bandwidth

The sampling frequency is expressed in samples per second (hertz) and defines the number of times in a second that the analog audio signal has been measured. Sampling frequency determines the audio bandwidth, or frequency response, that can be represented by the digital signal. A quick estimate of the maximum bandwidth capable of being represented at a given sampling rate is maximum analog frequency = sampling frequency/2. Higher sampling frequencies allow for wider audio bandwidth.

The 788T generates the following sampling rates:

- 32 kHz
- 44.1 kHz
- 47.952 kHz
- 47.952kF - file stamped at 48 kHz
- 48 kHz
- 48.048 kHz
- 48.048kF -file stamped at 48 kHz

See Time Code for more information about the 47.952F and 48.048F rates.

Bit Depth

The 788T records at bit depths of either 16 or 24 bits. 24-bit recording provides greater dynamic range and addition headroom for signal peaks relative to 16-bit recordings. 24-bit recording (versus 16-bit) is a significant benefit for field production audio tracks.

Bit Depth and Dynamic Range

Bit depth defines the digital "word length" used to represent a given sample. Bit depth correlates to the maximum dynamic range that can be represented by the digital signal. Larger bit depths accommodate more dynamic range. A quick estimate of the maximum dynamic range capable of being represented by a given word length is dynamic range ~= no. of bits x 6 dB. Bit depth is an exponential measure (exponent of 2), so as bit depth increases, the amount of data it represents increases exponentially. The majority of field recording is done with 16-bit audio, therefore, each sample is represented by a digital word of 2^16 (65,536) possible values. 24-bit audio has a word length of 2^24 (16.7 million) possible values per sample.

The 788T has 24-bit analog-to-digital converters. To obtain 16-bit recording the 788T can be set to dither 24-bit digital signals to 16-bit. The 788T uses a proprietary pseudo-random dither routine for accurate bit rate reduction. Dither can be defeated in the Bit Depth Setup Menu option. Without dither, 24-bit audio is truncated to 16-bit, meaning the least significant 8 bits are discarded.

Once a file is recorded its sampling rate and bit depth can not be changed in the recorder. The 788T does not perform sample rate conversion or bit depth changes. File conversion must be done in another environment, such as an audio workstation. Alternatively, a real-time analog transfer is often performed instead of sample rate conversion.

Synchronization

A stable sample clock source is essential for high quality digital audio. Setups involving multiple digital recording/playback devices often require that all devices are locked to a common clock reference to ensure they are synchronous i.e. run at the same speed and in phase with one another.

The 788T can act as a clock master, the provider of a reference clock, or as clock slave, where it locks its internal sample clock generator to a received external master reference clock. Neglecting synchronization can result in poor audio quality, sample clock timing errors, and time code drift.

The 788T uses a rock-stable sample clock and PLL circuitry to generate its internal clock frequency. The 788T disregards word clock, AES clock and video sync during playback.

Clock Master

The 788T provides a master clock reference via its WORD OUT BNC connector or via any of its balanced digital AES3 outputs. The difference between Word Out and AES is defined below.

Word Out

Word clock is purely a signal for sync purposes and contains no audio information. It is a square wave signal with a frequency equal to the 788T's internal sample rate. The 788T word clock output is always active. Connect the 788T's WORD OUT to the slave device's WORD INPUT.

Digital Outputs

AES digital outputs provide both PCM audio data and reference clock within the same stream. A compatible slave device is able to extract the reference clock from this stream at the same time as receiving the digital audio. This is ideal for recording the digital outputs of the 788T to a slave device with AES/AES3id inputs, only one cable is required to convey both signal and clock.

Clock Slave

The 788T is capable of locking its internal sample rate to incoming word clock, various video sync formats, and AES digital audio sources. Cameras and video decks typically transmit video sync whereas audio devices more often output word clock or digital audio.

When the 788T is slaved to an external sync source, be certain that the signal is stable. Loss of sync signal during recording can cause the 788T to revert back to its internal set sampling frequency causing audio glitches and/or sync issues later in post.

The 788T's sync reference is selected in the Rec: Sync Reference Setup Menu. The options for sync sources are:

- Internal
- Word Clock
- Video Sync
- Digital Inputs 1-2
- Digital Inputs 3-4
- Digital Inputs 5-6
- Digital Inputs 7-8

Internal

The 788T disregards any external sync source and sample clocks are internally generated. When set to Internal, the Sample Rate Converters will be applied to any incoming AES signal.

Sample Rate Converters

The 788T has high-quality, hardware sample rate converters (SRCs) on each of its AES/EBU digital inputs. The SRCs apply to AES signals when the Setup Menu option **REC: SYNC REFERENCE** is set to Internal. The 788T's digital inputs accept AES signals with sampling rates from 32 kHz to 192 kHz. With the sample rate converters each digital input can be fed with signals of any sample rate without having to word clock all of the devices together.

The SRCs are only active when needed; when not needed they are deactivated. To use digital inputs without the SRCs active, set the **REC: SYNC REFERENCE** Word Clock Input, Video Input, or to an AES input pair.

Word Clock

The 788T locks to a valid word clock connected via the Sync Input connector. If a valid word clock is detected, 'W' is displayed in the LCD. If a valid word clock is not detected, the input activity LED rings will flash yellow and the Lock indicator, 'W' will not appear.

Video Sync

The 788T locks to any valid video sync source, including composite NTSC, PAL and Tri-level connected via the Sync Input connector. If a valid video sync is detected, 'V' is displayed in the LCD. If a valid video sync is not detected, the input activity LED rings will flash yellow and the Lock indicator, 'V' will not appear.

Digital Inputs 1-2, 3-4, 5-6, 7-8

The 788T can be set to lock and derive its clock from any valid digital input pair even if the equivalent numbered analog input pair has been selected for recording. For example, sync reference is set to digital input 1-2 and inputs 1 and 2 are both set to MIC. If a valid digital input sync source is detected, 'D' is displayed in the LCD. If a valid digital input is not detected, the Input Activity Ring LED associated with the selected digital input sync source will flash yellow and the Lock indicator, 'D' will not appear.

If digital audio is connected to the 788T from more than one digital source, you must lock these sources together to a common reference otherwise differences between the sources' clocks will render their signals unusable. There is no sample rate conversion on the digital inputs when sync source is set to Digital Inputs, Word Clock, or Video Sync.

Notes regarding Word Clock Input and Digital Input clock references

1. **Loss of clock reference:** *If this occurs, the portion of the file recorded after the loss of ext clock reference may not play back at the proper speed. For reliability, we recommend you set the 788T to the same sample frequency as the external clock source. Loss of the clock signal in this case will most likely cause a short glitch in the file, but the file may still be usable since it will playback at nominally the correct speed.*

2. The 788T LCD main display screen shows the sample clock rate of the incoming word clock or digital input reference when locked ('D' or 'W' indicators are ON).

3. If multiple Digital Inputs are used, it is best practice to set the sync source to Internal. This will enable the hardware Sample Rate Converters on the 788T Digital Inputs and ensure that all inputs are synchronized.

Outputs – Analog and Digital

The 788T has six analog and six digital outputs. Each of these outputs is assigned an audio source independently, enabling the 788T to feed multiple outputs with unique program. Although there are only six outputs, it is possible to output all 8 channels by utilizing the Headphone Output together with the six outputs.

The chart below shows the audio sources available for the each channel of the Output Bus and Output Bus connections. The audio sources for each output bus are selected in the Setup Menu.

Available Output Sources	Description
Input **1** Input **2** Input **3** Input **4** Input **5** Input **6** Input **7** Input **8**	Inputs are assignable for each channel of the output bus. *When inputs are selected as the source for the outputs, the state of recording or playback activity has no effect on the output signal. This allows for uninterrupted audio at the outputs.*
Track **L** Track **R** Track **A** Track **B** Track **C** Track **D** Track **E** Track **F**	Tracks are assignable for each channel of the output bus.

Output Types

Audio signals routed to an output are sent to both the analog and digital outputs simultaneously. For example, the audio source signal selected for Output 1 is sent to both analog output 1 and digital output (AES) 1.

Analog Balanced Line Outputs 1-4

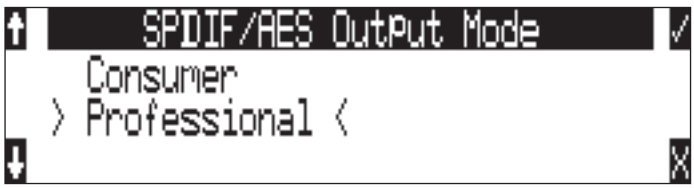
The analog line outputs are active-balanced line-level signals on Switchcraft TA3M locking connectors. The output level is a nominally 0 dBu at –20 dBFS. The line-level output can be attenuated in the Setup Menu by up to 20 dB.

Analog Unbalanced Output 5-6

This is a two-channel output on a TRS 3.5 mm connector with nominal level of -10 dBV. This level can be attenuated in the Setup Menu by up to 20 dB.

Balanced Digital AES Outputs 1-6

Balanced AES outputs 1-4 are on TA3 connectors on the right side panel. Balanced AES outputs 5-6 are on the DE-15 connector on the rear panel. *See Connector Pin Assignments.* These outputs are compatible with most S/PDIF inputs.



The format for the AES3 output is selectable between professional AES and consumer SPDIF. In either case the SCMS bit is not set. The output level of the digital outputs is not adjustable.

Headphone Output

The 788T headphone output is a flexible tool for monitoring audio in the field. The 788T allows the user to monitor inputs and tracks in a number of combinations. MS stereo and B-format surround decoding are also available as headphone monitoring options.

The headphone output is independent of the Output Buses and audio sources can be routed to headphones independent of routing assignments to output buses. The headphone output source is sent to both the 1/4-inch and the 3.5mm TRS jacks.

The 788T is capable of driving headphones to extremely high sound pressure levels. Hearing experts advise against exposure to high sound pressure levels for extended periods.

Selecting Headphone Sources

The headphone source display on the main LCD screen ( ) shows the audio sources sent to headphones. The 788T comes from the factory with several preset headphone audio source selections available on the Multi-Function Rotary Switch. These selections include inputs and tracks. Turn the Multi-Function Rotary Switch to select among the available headphone monitoring sources.

Setting Headphone Source Options

The user can define which headphone routings will be available when turning the Multi-Function Rotary Switch. Headphone monitoring sources can be set from various combinations of inputs and tracks, including stereo MS decoding, and SoundField B-Format surround decoding. The order of monitor sources is also user selectable.

To set the available headphone source options:

1. Enter the **HP: MONITOR MODES** Setup Menu option. Once you enter the Monitor Modes menu you will immediately be in slot-1.
2. Turn the Multi-Function Rotary Switch to select the source you wish to appear first in your Headphone monitor list.
3. Once the chosen source appears, press the Multi-Function Rotary Switch or the soft key **ENTER** (Tone) key to move to the next slot.
4. Continue down the list to select the source for each slot in the list.
5. Once all sources have been chosen, select **DONE** and press **ENTER**. This will exit the headphone monitor mode setup. You can exit the selection process by pressing the Stop key or cancel (LCD Backlight) key at any time.

If you press (done) in the first headphone slot, the 788T will select a single option (Tracks L, R) for headphone monitoring. The other factory presets will be erased.

Available audio sources for headphone monitoring include:

HP Sources	Description
Inputs 1,2 Inputs 3,4 Inputs 5,6 Inputs 7,8	Stereo monitoring of input pairs. Inputs 1, 3, 5, and 7 are assigned to left headphone outputs; inputs 2, 4, 6, and 8 are assigned to right headphone outputs.
Tracks L,R Tracks A,B Tracks C,D Tracks E,F	Stereo monitoring of track pairs. Tracks L, A, C, E are assigned to left headphone output; tracks R, B, D, and F are assigned to right headphone output. Upon playback, will play as track monitor.
Input 1,1 Input 2,2 Input 3,3 Input 4,4 Input 5,5 Input 6,6 Input 7,7 Input 8,8	Solo monitoring of selected input. This signal is sent to both sides of the headphones.
Track L,L Track R,R Track A,A Track B,B Track C,C Track D,D Track E,E Track F,F	Solo monitoring of selected track. This signal is sent to both sides of the headphones. Upon playback, will play as track monitor.
Inputs 1,2 (MS) Inputs 3,4 (MS) Inputs 5,6 (MS) Inputs 7,8 (MS)	Stereo monitoring of discrete M (mid) and S (side) input pairs. Highlighted media is source of monitor program.
Tracks L,R (MS) Tracks A,B (MS) Tracks C,D (MS) Tracks E,F (MS)	Stereo monitoring of discrete M (mid) and S (side) track pairs. Highlighted media is source of monitor program. Upon playback will function as MS track monitor.
Inputs 1-4, 1-4 Inputs 1-6, 1-6 Inputs 1-8, 1-8	Combinations of summed inputs appear in each ear.
Tracks LA, RB Tracks LAC, RBD Tracks LACE, RBDF Tracks LRAB, LRAB Tracks LRABCD, LRABCD Tracks LRABCDEF, LRABCDEF Tracks LR, LR Tracks LRA, LRA Tracks LRB, LRB Tracks LRC, LRC Tracks LRD, LRD Tracks LRE, LRE Tracks LRF, LRF	Combinations of summed tracks appear in each ear.
Inputs **B-format stereo** Tracks **B-format stereo**	The built-in SoundField B-format decoder uses three inputs to build a left/right stereo signal for monitoring.

When tracks are monitored in headphones, audio assigned to the tracks is heard in headphones while Recording. During Playback the recorded track audio is heard in headphones.

MS Stereo Monitoring

The MS stereo mode decodes discrete Mid-Side stereo signals to a left/right stereo signal for monitoring purposes. This allows for a proper stereo signal to be monitored in the field while discrete M and S signals are recorded for later post production. For the MS decoder to operate properly, the Mid signal is connected to either of the odd inputs (1, 3, 5, 7) and the Side signal is connected to the even inputs (2, 4, 6, 8). The amount of stereo "spread" is fixed at a 50/50 percentage from Mid to Side signal.

If MS is selected for input linking, do not use MS stereo monitoring. This would result in two MS decoders being inserted in the signal path. The resulting audio in the headphones would be the discrete M and S signals!

SoundField B-Format Surround Monitoring

SoundField B-format is a four channel surround sound format generated by SoundField surround microphones. The 788T can accept the four signals output from a SoundField microphone and record each to its own track.

When recording four-channel B-format audio, the 788T headphone monitor can decode the B-format signal into L/R stereo. The 788T constructs a stereo signal using the W, X, and Y signals of the B-format. The Z-axis signal is not used. Similar to the 788T's MS stereo monitoring, the stereo width is fixed for headphone monitoring.

To record and monitor B-format signals, connect signals as follows:

SoundField →	**788T** →	**Resulting File Name (for monophonic file type)**
W signal →	input 1, track L →	**FILE _ 1.WAV**
X signal →	input 2, track R →	**FILE _ 2.WAV**
Y signal →	input 3, track A →	**FILE _ 3.WAV**
Z signal →	input 4, track B →	**FILE _ 4.WAV**

SoundField files generated in other recorders or software applications can be copied to Compact-Flash or the 788T hard drive and can be played back and monitored in stereo. Make certain that channel assignments follow the order above for proper headphone decoding. If multiple monophonic SoundField .WAV files are named using the "_W, _X, _Y, _Z" suffixes, the 788T will recognize that these are multiple monophonic B-format files and will play them back in the proper track order.

The 788T can play back monophonic or polyphonic B-format files.

There are two B-format monitoring selections, one for inputs and one for tracks. They are listed as **INPUT B-FMT STEREO** and **TRACK B-FMT STEREO**. For most recording and playback applications the track monitor selection is appropriate. If the user wants to hear the inputs at all times, the input monitor selection is appropriate.

Multi-Function Rotary Switch Behavior

From the Factory, pressing in on the Multi-Function Rotary Switch will automatically recall the headphone monitor source defined in the Setup Menu option **HP: FAVORITE MODE**. It can also be set to quickly toggle through the available storage media from which the recorder will playback from, or it can be disabled.

- **Disabled**: pressing the Multi-Function Rotary Switch has no effect.
- **Selects Favorite Mode**: recalls the headphone source selected in **HP: FAVORITE MODE**.
- **Playback Drive Select**: selects which of the available storage media to playback from.

Headphone Favorite Selection

If Selects Favorite Mode is selected from the choices above, pressing the Multi-Function Rotary Switch selects the monitor source defined in the Setup Menu option **HP: FAVORITE MODE**. This feature is helpful to quickly return to a selected headphone monitoring source while recording or playing.

Headphone Playback Mode

A single headphone source can be set to automatically activate upon playback. All headphone monitor combinations are available in the Setup Menu option **HP: PLAYBACK MODE**. No Change can also be selected, which makes no change to the headphone selection during playback.

Headphone Warning Tones

The 788T generates audible beeps, or warning "bells", in the headphone monitor when an error has occurred. The specific error will be reported on the LCD. The output level of the warning bell can be adjusted from Off or -60 to -12 dBFS in the Setup Menu option **HP: WARNING BELL LEVEL.**

Recording Start and Stop Tones

If enabled in the Setup Menu option **HP: RECORD/STOP BELL**, the start of recording can be indicated audibly by a single, 440 Hz tone sent solely to headphones. When recording is stopped, two 220 Hz tones will be sent to the headphones.

Low Battery Warning

Warning tones are sent to the headphones when either the attached battery or external power supply voltage reaches their low warning levels (6.9 V for the attached Li-ion, 10.5 V or user-selectable in the Setup Menu option **POWER: EXT LOW BATT VOLT**). The Low Battery Warning is three short 880 Hz tones that are sent every 20 seconds.

If all warning tones are turned Off, no tones are sent to headphones, including the Low Battery Warning.

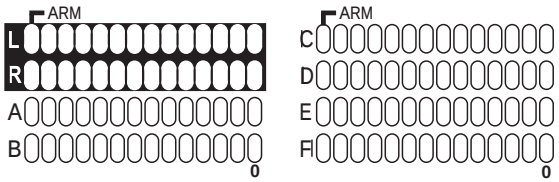
Headphone Power Up Gain

The 788T's headphone level is adjustable from Off, -40 dB to 26 dB in 2 dB increments. The Setup Menu option **HP: POWER UP GAIN** sets the headphone level control upon start up to: Off, the Last Gain setting used, or at Midpoint Gain (0 dB).

Metering and Display

The 788T features a 104 LED (8 x 13) Output Meter. The DSP-controlled output meter provides a selection of ballistics and lighting intensities. Input Activity Ring LEDs are available on each of the input channels indicating input level and clipping activity. In addition, a Headphone Peak LED is available to indicate that clipping is occurring in the headphone monitor.

Output Meter



The meter uses energy efficient LEDs which are viewable in full sunlight. The 788T Output Meter is unaffected by shock or extremes in temperature and humidity. Meter ballistics and peak hold duration are selectable in the Setup Menu.

The meter uses a non-linear scale which increases resolution in the most important part of the scale. From –44 to –12 dBFS, each LED segment equals approximately 4 dB. From –12 to 0 dBFS, each segment equals 3 dB. The LED indicating 0 dBFS actually illuminates at -0.2 dBFS.

The LED Output Meter uses a tri-color scale, allowing the track levels to be easily viewed and monitored. The scale is separated by Green LEDs to indicate normal input to track activity from -44 to -12 dBFS, Orange LEDs to indicate a hotter input to track activity from -9 to -6 dBFS, and Red LEDs to indicate that the input to track activity is approaching clipping from -3 to 0 dBFS.

Meter Ballistics

The output meter can be set to display any of three types of meter ballistics: VU, Peak, and a combination of VU and Peak. The meter ballistics are selected in the Setup Menu option **METER: BALLISTICS**.

VU (Volume Units)

Ballistics correspond closely to how the human ear perceives loudness and provides a good visual indication of how loud a signal will be. In VU mode, the attack and decay of the meter signal is 300 msec. While giving a very good visual indication of perceived loudness, VU meters give poor information on actual signal peaks and thus not ideal for use during recording. In VU mode, the front panel meter labeling is in volume units.

Peak Only

Peak-reading ballistics correspond to actual signal maximums, but don't necessarily correspond to perceived signal loudness. A peak meter has a near-instantaneous attack to display maximum signal amplitude and a slow decay to allow the user to see them. Peak metering is essential for digital recording, since signal overload can cause immediate distortion. The peak meters front panel markings are calibrated in dBFS, decibels relative to full-scale digital signal.

Peak/VU

Peak/VU mode will display VU and Peak level information simultaneously. In this mode, the perceived loudness (VU) is displayed as it is in VU mode, and the Peak level is indicated by the uppermost LED. With this combination the user gets the best of both VU and Peak metering by seeing both the perceived loudness and the peaks of the signal at the same time. Peak/VU is the factory default.

Peak Hold Time

Peak-hold indicators are useful for metering in applications when an overload condition is unacceptable or when program material must not exceed a prescribed threshold. The Peak Hold Time is user selectable in the Setup Menu option **METER: PEAK HOLD TIME.** The peak LED will hold its position for the selected duration from 0 to 5 seconds in .1 second increments. This allows for easy viewing of peak values that could otherwise go unnoticed.

Input Activity Ring LEDs

The LEDs surrounding the Input gain pots indicate the input activity for each input respectively. The LEDs illuminate in various colors and intensities to represent the state of each input.

LED Color	Description
Green	Analog and digital input signal presence. LED brightness intensifies as the amplitude of the input signal increases.
Red	Input signal has reached the user-defined Input Peak Threshold. The threshold level is set in the Setup Menu option Meter: Input Peak Threshold from -20 to -1 dBFS.
Yellow	Input limiter is attenuating. LED brightness intensifies as the input signal increases.
Flashing Yellow	Input type has been selected to digital but the input is not currently locked. i.e. No digital input has been detected. All eight input activity LEDs will flash yellow when a video or word clock reference has been selected but a valid source is not detected.

If a digital input has been selected and the 788T detects a valid digital signal, the Input Ring LEDs will follow the normal red and green LED behavior. The Input Activity Ring LEDs can be defeated by color in the Setup Menu option **METER: INPUT LED RING MODE**.

Headphone Peak LED

The headphone circuit has an indicator for peak overload. Monitoring without a visual indication of headphone clipping may mislead the operator into thinking that the record or playback signal is distorting.

Tone Oscillator

The tone oscillator can be used as an aid to lining up levels. Both tone level and frequency are user selectable. Reference level is adjustable over a range of –40 to 0 dBFS in the Setup Menu option **TONE: LEVEL**. Reference tone frequency is adjustable from 100 to 10,000 Hz in the Setup Menu option **TONE: FREQUENCY**. Standard tone levels vary according to the practices and needs of production and post-production, but are generally in the –20 to –12 dBFS range.

The tone oscillator is activated by pressing the TONE key. Tone is only active while the TONE key is pressed. Tone is routed where specified in the Setup Menu option **TONE: MODE**. Routing choices include: Outputs only, Outputs and Tracks, Tracks only, or no tone routing (disabled). When

routed to Tracks, all selected record tracks will receive the tone signal. Tone can only be recorded to the head of an audio file. To record tone, press the TONE key and continue to hold it down while starting to record. Subsequent presses of the TONE key are locked out to prevent tone from being inadvertently recorded.

LCD Contrast & LED Brightness

LCD contrast is controlled in the Setup Menu option **LCD: CONTRAST**. From the factory, the contrast is set to 50%, suitable for most viewing conditions. Contrast can be adjusted from 0 to 100% in 1% increments.

LED brightness is continuously adjustable from low to high. To adjust the LED brightness level, hold down the LCD Backlight key then turn the Multi-Function Rotary Switch. In Stealth Mode the LEDs are toggled On and Off with the LCD backlight key. Enable Stealth Mode in the Setup Menu option **METER: STEALTH MODE.**

LCD Backlight

The LCD Backlight key toggles the LCD and Front Panel Soft Key backlight. Backlighting is suitable in low or no ambient light situations. By Factory Default the LCD backlight will be White in Standby, Green in Playback, and Red in Record Modes. The user can defeat the LCD backlight by color in the Setup Menu option **LCD: BACKLIGHT MODE**.

White/Green/Red	This is the Factory Default setting. The backlight will illuminate White in Standby, Green upon Playback, and Red upon Recording.
Red on Record Only	The LCD backlight will illuminate Red during Recording and White for Standby and Playback..
Green on Play Only	The LCD backlight will illuminate Green during Playback and White for Standby and Record..
White Only	The LCD backlight will remain White at all times.

Time Display and Record Indication

The position of the A-time numbers and time code numbers can be exchanged in the Setup Menu option **TIME CODE: DISPLAY MODE**. When Big Time Code is selected, the time code value is displayed in the main numeric display. If time code is turned Off, the A-time is displayed as large numbers, even when Big Time Code is selected.

reversed numbers indicating that recording is active

To provide for additional visual indication that recording is in process, the big numerals can be set to reverse contrast or to flash during record. This is selected in the Setup Menu option **REC: RECORD INDICATOR**.

Time Code

The 788T holds accurate time code for up six hours between battery changes using its internal, Li-Ion time code battery. After six hours without power, the 788T reverts to a slightly less-precise time-of-day crystal to maintain the date/time of the unit. This time code battery is charged from internal or external power whenever the 788T is powered up.

If the time-of-day clock is reset during the production day or if the time code mode is changed from 24 hour run to another mode and back, the time code value will change. You must re-jam all time code devices to ensure proper synchronization.

File-based recorders place a single time code stamp in the BEXT and iXML chunks of an AES31 (Broadcast WAV) file. The 788T generates SMPTE time code from this number and extrapolates it based on the time code frame rate for playback.

All files generated by the 788T have time code numbers begin on the 0 frame (or 02 in DF modes). If necessary, pre-roll is dynamically applied to accomplish this. This simplifies synchronization in post-production. Furthermore, all files end on the 0 frame such that a file's duration is always an integer number of seconds long. If necessary, post-roll is applied to accomplish this.

Frame Rate

A single time code frame rate is selected in the Setup Menu option **TIMECODE: FRAME RATE**.

Sound Devices strongly recommends that the appropriate frame rate be confirmed with Post Production prior to the start of production.

The 788T supports all of the common production time code frame rates, including:

- **23.976** – This frame rate is most often used in productions shooting with Sony high definition video cameras. Counts 0.1% slower than real time.
- **24** – Frame rate of standard film. Sometimes, it is also used in high-definition video production.
- **25** – The frame rate of PAL video. Most often used in video and film production in Europe and other PAL based nations.
- **29.97** – The frame rate of NTSC color video. Most often used in the USA and other NTSC based nations. Counts 0.1% slower than real time.
- **29.97DF** – The frame rate of NTSC video modified to match real time. Drop frame time code is primarily used in the NTSC broadcast industry where it is often required that the time code of finished program material reflects actual real time duration.
- **30** – Originally, the standard frame rate for American black and white television. Today, it is most often used to sync sound to film where transfer to NTSC video is expected.
- **30DF** – This is a rarely used non-standard frame rate. Do not use unless specifically requested by production. Counts 0.1% faster than real time.
- **30+** – This setting is specific to Sound Devices recorders. Records at 48.048 sampling rate at 30 frames per second but stamps the file at 48kHz, 30 frames per second.

F Sampling Rate Modes

48.048k and 48.048kF

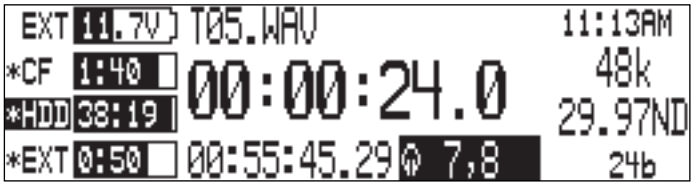
The 48.048kF mode (F stands for fake, faux, Fostex—take your pick) is a specific compatibility mode for use with the Fostex DV40 software (1.74 and previous), Avid, Final Cut Pro, and other post-production environments that do not recognize audio files written at 48.048 kHz. In this mode files are recorded at a 48.048 kHz sampling rate but are stamped at 48 kHz. When played, they will play back 0.1% slower than real time.

One use for the 48.048kF mode is to force a 0.1% speed reduction (pull down) of audio to match MOS-telecined film (24 fps-to-NTSC) in non-linear edit systems, such as Avid or Final Cut Pro. Since the file is stamped as a 48 kHz file, the edit system will play it back at 48 kHz and not at 48.048 kHz. This "audio pull down" will match the transferred picture without the need for an intermediate step through other software to create the pull down.

The time code frame rate (actual recording rate) is forced to 30 ND in 48.048kF mode. The LCD display will show 30 ND during recording. No other frame rate is available in 48.048kF mode.

the file is recorded at 48.048 k, 30 ND

The audio file, however, is stamped with a 29.97 ND frame rate, along the 48 kHz sampling rate. It will appear as if the file was originally recorded at a 48 kHz sampling rate at a TC rate of 29.97 ND.



on playback, file appears at 48 k, 29.97 ND

Fostex DV40

When using files recorded in the 48.048kF mode in with a DV40 with early software, set the DV40 time code frame rate to 29.97ND. Time code stamps will properly match the original time code start times.

47.952k and 47.952kF

Both 47.952 and 47.952kF settings use a record sampling rate of 47.952 kHz, 0.1% lower than 48 kHz. The 47.952kF mode, however, identifies the file as being recorded at 48 kHz. Additionally, in 47.952kF mode, the time code rate is restricted to 29.97ND, while the file is identified as 30ND.

47.952F mode is useful in applications where the 788T is recording in high-def environments with cameras at 23.97 and post production is using a straight 24 frame session.

Time Code Modes

The 788T includes the following time code modes:

Off

The time code generator is disabled. The front panel time code display is blank.

Free Run:

The internal time code generator runs continuously without regard to the Record mode. Any time code value can be used as the start value by "jamming value" in the jam menu.

Record Run

The time code generator runs only when the 788T is recording. Time code in this mode defaults to 00:00:00:00 at power-up. When switching to Record Run from another mode, the internal generator will stop at the last number generated. A user-defined value can be jammed into the internal generator from the jam menu.

Free Run Jam Once

The onboard time code generator will re-jam from external time code whenever a valid, running time code signal is connected to the TC input. Similar to Free Run mode, the generator runs continuously without regard to Record mode. For a jam to occur, the time code signal must be disconnected and re-connected to the time code input. Free Run Jam Once is useful when using the recorder as a slave, although one of the External TC modes may be more appropriate for slaved operation.

24 Hour Run

Identical to Free Run with the exception that the generator will automatically jam itself from the time-of-day clock on power-up. The generator will also re-jam if the time-of-day clock is reset. Once jammed, the generator will run continuously from the time code clock, not the time-of-day clock.

Ext TC

The internal time code generator follows an external time code signal appearing at the time code input. In all of the external time code modes, the time code value set on the 788T appears as the recorded file's time code rate value.

Ext TC/cont

The internal time code generator follows an external time code signal appearing at the time code input. If the external time code is removed, the internal generator continues to run to preserve continuous time code. Useful for time code transmission over RF where RF "hits" may interrupt time code.

Ext TC-Auto Record

The internal time code generator follows the external time code signal appearing at the time code input. When external code advances, the 788T enters Record mode automatically. When the external code is stopped, the 788T generator pauses and recording is stopped. This is appropriate when dual-system sound is used with video cameras set for Rec Run time code. The video camera will function as master time code and the recorder "transport" will follow the video camera transport.

Ext TC/cont-Auto Record

The internal time code generator follows the external time code signal appearing at the time code input. When external code advances, the 788T enters Record mode automatically. When the external code is stopped, the 788T generator pauses and recording is stopped. If the external time code is removed the internal generator continues to run to preserve continuous time code. Useful for time code transmission over RF where RF "hits" may interrupt time code. This is appropriate when dual-system sound is used with video cameras set for Rec Run time code. The video camera will function as master time code and the recorder will follow.

In Free Run Jam Once and all four external time code modes, time code is recalculated, "back stamped," when external static time code advances after the 788T begins recording. If external time code does not advance, the file will be stamped with the stopped time code number. Back stamping the file allows the audio time code to properly correspond to picture time code if sound rolls before picture in a video Rec Run environment.

Time Code Hold Off

In the industry there are a wide variety of time code generators. Time code streams are standard from device to device; however, the start and stop sequence of the time code stream can differ. Because of this, the 788T recorders were susceptible to generating unintentional takes when in **EXT TC -** Auto Record or **EXT TC/CONT - AUTO RECORD** modes.

Time Code Hold Off is designed to eliminate unintentional takes from occurring. The user can now determine a duration in which a valid external time code signal has to be detected before the recorder generates a new take. The value of Time Code Hold Off needed is dependent on the start and stop sequence of the master time code source.

To use the Time Code Hold Off feature:

1. Access the Setup Menu option **TIMECODE: HOLD OFF**.
2. Set a value between 0 and 8 seconds in .1 second increments using the soft Up and Down Arrow (Menu and HDD) keys or the Multi Function Rotary Switch. 2.0 Seconds is the factory default.

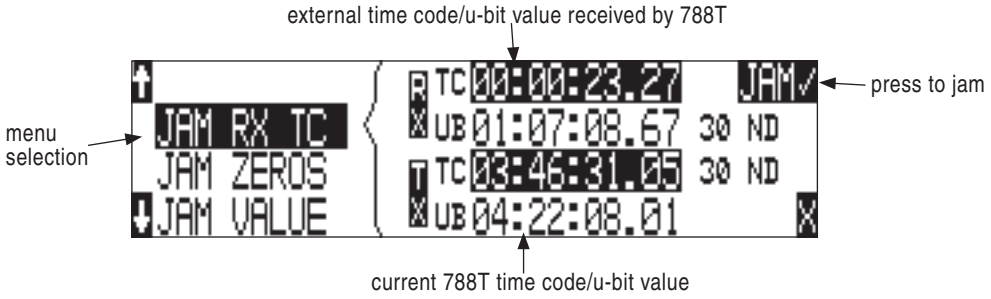
3. Save the selected value by pressing the soft Check Mark (Tone) key or by pressing in on the Multi Function Rotary Switch.
4. Exit the Setup Menu by pressing the soft X (Brightness) key or the Stop key.
5. Begin rolling time code from the master time code source.
6. The 788T recorder will display the Record Pending message immediately after detecting a time code signal.

7. When the selected Hold Off value has elapsed, the 788T will begin recording.

Things to consider when using Time Code Hold Off:

- This feature only applies to **EXT TC - AUTO RECORD** and **EXT TC/CONT - AUTO RECORD** modes.
- If Pre-Roll is set, it will be applied. Pre-Roll will only capture audio from the initial detection of a time code signal. If no Pre-Roll is selected, the file will begin after the Hold Off time expires. It is best practice to set Pre-Roll, in the Setup Menu option **REC: PRE-ROLL TIME**, to a value greater than the selected Hold Off value. This ensures that audio is captured from the moment a time code signal is detected and unintentional files triggered by short bursts of time code are not generated.

Jam Menu

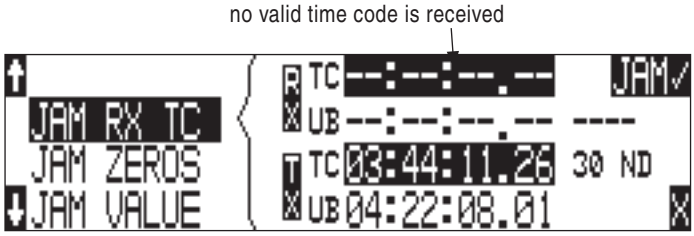


Time code setup is managed in the Setup Menu option T**IME CODE: JAM MENU**. To quickly enter the Jam Menu simultaneously press the HDD key and the MENU key. In this menu, the top of the display shows the value of signal present on the time code input and the bottom of the display shows the currently set time code value. In addition, the 788T displays the frame rate of the incoming time code and the current frame rate setting of the 788T.

The 788T time code generator can be set in three ways.

Jam RX TC

When the JAM RX TC menu item is highlighted in the jam menu, the external time code, user bits, and frame rate are shown at the top of the LCD screen; the 788T internal generator, user bits, and frame rate are shown at the bottom of the screen. To jam the 788T from an external value, press the JAM soft key (TONE key) or the Multi-Function Rotary Switch. The screen will display **JAMMING**. Once the 788T is jammed to the external time code, the external and internal numbers will match and run in sync.

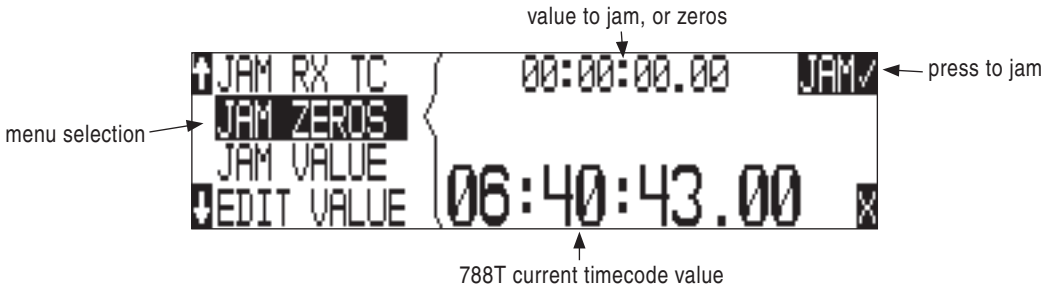


Make certain that the external time code source appears in the time code jam menu. If the 788T does not receive valid time code from the sending source the jam menu displays lines in place of numbers.

Identical to the Ambient Recording series of time code products, the 788T time code generator can "cross jam" differing frame rates. The 788T will cross jam time code at the top of the second for phase-accurate (the 00 frames will match) time code at the set frame rate.

Jam Zeros

This menu selection resets the internal generator to zero.



Jam Value

Press the enter soft key (TONE key) or the Multi-Function Rotary Switch button to jam the user-entered time code start value into the internal generator.

Edit Value

This menu allows the user to set any valid time code value (**00:00:00:00–23:59:59:29**) for entry with the jam value selection above. The initial screen of this menu shows the currently set value as well as the current time code setting of the 788T. Press the Multi-Function Rotary Switch or the enter key (tone key) to enter into edit mode. The user can set the time code numbers in pairs (hours, minutes, seconds and frames). Once **(DONE)** is selected the value is available to jam into the internal generator with the jam value selection.

A value is not jammed into the 788T time code generator until **JAM VALUE** *is selected.*

User Bits

The 788T has seven user-selectable user bit modes. Time code user bits are a portion of the time code data which can be allocated however the user chooses. Commonly, user bits carry information such as the date, take, sound roll, or camera roll number.

User bits are edited from the **EDIT U-BIT** selection in the jam menu. Press the enter soft key (TONE key) or the Multi-Function Rotary Switch to enter user bit edit mode. The screen will show the format and setting of the user bits. Using the Multi-Function Rotary Switch or the Up and Down Arrow soft keys, user bit digits can be edited (in pairs). Once **DONE** is selected, the user bits are set. If editing is not available in the selected user bit mode "**NO USER EDITS**" will appear in the screen.

NTSC Standard Def Video Production

NTSC video uses a frame rate of 29.97 frames per second. Unfortunately, that leaves 108 frames per hour unaccounted. To keep 29.97 time code in sync with "clock" time, the concept of "drop frame" was devised. Two frames are dropped at the top of each minute not divisible by 10. 54 drops per hour x 2 frames = 108 frames per hour.

To sync the 788T to a video camera, first determine if the camera is in drop frame or non-drop frame mode. If you, the DP or the producer are unsure about what setting to use, check with post-production, if possible.

As a rough guideline, video for NTSC broadcast is drop-frame. Whether at drop or non-drop rates, make certain all time code devices are at the same rate.

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1. Set the 788T to either 29.97DF or 29.97 respectively.
2. Jam the camera using a LEMO-5 to BNC adapter cable connected to the time code input on the video camera.
3. Switch the camera to free run time code. The 788T time code should appear in the time code display on the camera.
4. Disconnect the time code cable.

The camera and recorder time code should now be running in sync. Check it after roughly 5 minutes to be certain synchronization is maintained.

Video cameras are notorious for time code instability when powered down. If the video camera must be shut down, re-jam it when it is powered back up.

Recording

Recording and Playback functions are quite similar to that of tape-based machines. The flexibility of file-based recording provides control not possible with tape-based recorders.

Recording

REC The largest, most easily accessed control on the 788T is its REC key. Recording takes priority over all activity except for disk formatting, disk speed tests, and file transfers. The 788T will immediately enter Record mode whenever the REC key is pressed. If the storage media selected is not ready to begin recording a new file, the REC key will flash red and the LCD will display Record Pending until the recording has begun.

When recording, the REC key, adjacent red LED, and the LCD backlight will all illuminate red to indicate that the unit is in Record mode. The LCD backlight illuminates red in record mode by factory default, this can be defeated in the Setup Menu option **LCD: BACKLIGHT MODE**.

Ultra reliable 8-track recording is further enhanced by the 788T's ability to prevent file corruption even in the event of power failure during recording. The 788T achieves this by automatically updating the WAV file header information every 20 seconds. At most, the last 20 seconds of recording might be lost.

If no inputs are routed to tracks, recording cannot take place. Make certain that at least one record track is assigned for recording.

While recording, the POWER, FAST FORWARD, REWIND, INPUT, TONE, and HDD keys are disabled. See *Panel Lock* to engage Panel Lock during recording. Stop recording by pressing and holding the STOP key. The STOP key must be held for 150 msec or greater to end recording. Although you can enter the Setup Menu during recording, menu items that affect recording are lined out in the menu list.

During recording, subsequent presses of the REC key can perform one of three Setup-Menu-selected actions:

- no action,
- new cue - cue markers are set within the file being written,
- new file - a new file is started with each press of the REC key, the take counter increases by one.

Pre-Record Buffer

To prevent missing record cues or up-cutting takes, the 788T has a pre-record (or pre-roll) buffer. When active, pre-record begins recording at a set number of seconds preceding the REC key being pressed.

Record buffering is disabled when the time code mode is set to Record Run, External Time Code Auto Record, and External Time Code Continuous Auto Record. This prevents possible overlapping time code numbers between adjacent files.

Failure During Recording

In the event of a storage media failure, the specific error will be indicated on the LCD and warning bells in the headphone monitor. Possible causes of media failure include, a hard drive in severe motion which results in recording errors, a CompactFlash card filling up while recording, or an external DVD-RAM that can't keep up with the chosen data rate, track count, or file type. If more than one drive is selected for recording, the remaining drives will continue recording without failure.

Playback

The 788T has high-resolution playback circuitry and is appropriate for any reference audio application. Any file recorded by the 788T can be played back. In addition, MP2, MP3, and WAV files can be copied to the storage media from a computer can be played back. This is useful when using the 788T as a high-resolution playback device. In Playback mode, the LCD backlight will illuminate green by factory default, this can be defeated in the Setup Menu option **LCD: BACKLIGHT MODE**.

The 788T plays back the last recorded audio file unless another file is selected. There are two ways to select another file for playback. To select another file in the current record directory, from stop mode, push either the FastForward or reverse key to put the 788T into play-stop mode. The filename display will begin flashing and the FAST FORWARD and REWIND keys are used to step through files available in the current record directory. To select a file in an alternate directory, press the HDD key to enter the media directories. Navigate to the appropriate directory. Select the file that is desired for play back with the Multi-Function Rotary Switch and press the PLAY key.

The current playback media is indicated by the highlighted (white type on black background) media descriptor on the left hand side of the main LCD display. Regardless of the directory selected for playback, when the REC key is pressed, the 788T will revert to the directory determined by the **REC: MEDIA SELECT** and **FILE: FOLDER OPTIONS** Setup Menu settings.

AutoPlay

The 788T can be set to play back all valid audio files in a directory. Files will play back in their order in the directory. Varios autoplay options can be set in the Setup Menu option **PLAY: AUTOPLAY MODE**:

- **Disabled** – auto playback is Off
- **Play all** – all files in the directory will play, then stop when all files have been played
- **Repeat one** – the selected file will play back continuously until stopped by the user
- **Repeat all** – all files in the directory will play in succession, then repeat until the Stop key is pressed.

Audio File Formats

The 788T records audio to the industry-standard Broadcast Wave file format, either monophonic or polyphonic. Additionally, the 788T will also playback files in the WAV, MP2, or MP3 formats. The 788T will also read files with the .BWF extension.

.WAV

The 788T writes AES-31 Broadcast Wave formatted files. The audio files created by the 788T include additional information (Metadata) in the file's header, BEXT (Broadcast Audio Extension) and iXML data chunks. *See Appendix 2 – Metadata Implementation.* Software that does not recognize these additional broadcast wave data chunks will simply ignore them.

File Type

The 788T has two file type options for recording, WAV mono and WAV poly. Select the file type in the Setup Menu option **REC: FILE TYPE**.

Monophonic

When WAV Mono is selected, the 788T will generate a separate audio file for each recorded track. The mono files generated by the 788T have file names similar to T01_1.WAV and T01_2.WAV. The file name suffixes, _1 and _2, identify the track number of the file. Monophonic files can be combined into polyphonic files using Sound Devices Wave Agent software utility.

Polyphonic

When WAV Poly is selected, the 788T will generate one audio file for each take. All recorded tracks are interleaved into this single file. The tracks are still isolated and can be separated into monophonic files using Sound Devices Wave Agent software utility.

Take Management

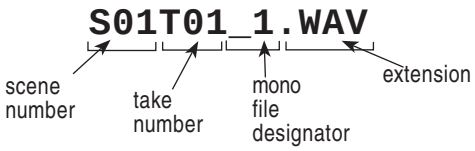
A Take is a single recording which is composed of one or more audio files.

For polyphonic wav file recordings, a take is represented by a single polyphonic file generated at the time of recording. The single polyphonic file contains all the tracks of the take. In this case, since the take is represented by this one file, its name is the same as the file's name.

In the 788T, a polyphonic take/file name consists of a scene name, take number, and a file extension. For example, for scene S01, take T01, the polyphonic file name and take name are both S01T01.wav.

For monophonic wav file recording, a take is represented by a group of monophonic files generated at the time of recording. Each monophonic file represents an individual track of the take. In this case, since the take is represented by several files, its take name is the same as any of the constituent files' names except with the track number suffix is replaced by '_X'.

In the 788T, a monophonic file name consists of a scene name, take number, track number suffix and a file extension. *See Appendix 3 – File Naming.* For example, for scene S01, take T01, comprising of 4 tracks, the monophonic file names are S01T01_1.wav, S01T01_2.wav, S01T01_3.wav, S01T01_4.wav, and the take name is S01T01_X.wav.



Scene Name/Numbering

Scene names are selected for use from a scene name list. This list is managed in the Setup Menu option **REC: SCENE NAME/NUMBER**. Any number of scene name lists can be generated and these can be made up of any number of scene names. The advantage of scene name lists is that frequently used scene names can be compiled before production starts.

Scene names are made with alphanumeric characters, including "_ " and "-" and can be any length between zero (0) and nine (9) characters. Scene numbers help to match audio with the corresponding scene in a production. Scene names can also be used to identify other items, including roll number, recording date, artist name or any other descriptor as required.

Scene names are user-selected in the Setup Menu and do not change until changed by the user.

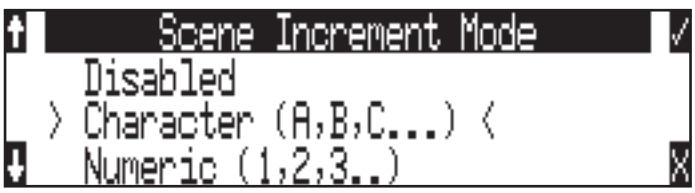
To change scene numbers:

1. Enter the user menu and navigate to the Scene Name/Number option.
2. Use the REWIND (<<) and FAST FORWARD (>>) soft keys to move among characters. Use the PLAY key to delete characters. Characters are entered from left to right and deleted from right to left.
3. Use the Multi-Function Rotary Switch or the Up and Down Arrow soft keys to choose characters. Press the Multi-Function Rotary Switch or press the FAST FORWARD key to save the character and move to the next position.
4. To save the scene name, press the soft Check Mark (TONE) key or press in on the Multi-Function Rotary Switch without selecting a character. After the ninth character is entered, the scene name is automatically saved.

If all characters are removed, no scene name will be written to files.

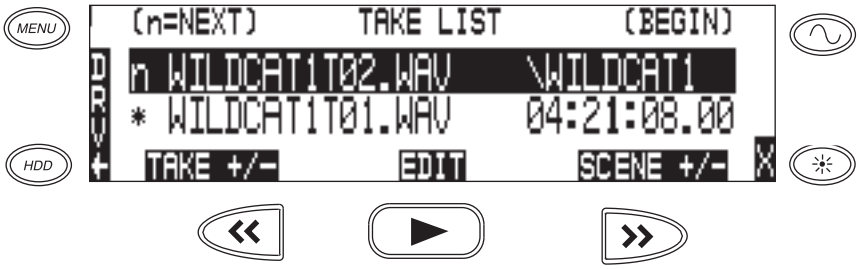
Scene Name Incrementing/Decrementing

Scene Names can be quickly incremented from the main screen by pressing and holding the Stop key and then the Fast Forward key. *See Front Panel Button Shortcuts.* Scenes will be incremented by either alpha characters (A,B,C...) or numeric digits (1,2,3...). This is selectable by the user in the Setup Menu option **REC: SCENE INCREMENT MODE**.



To increment the Scene Name/Number from the Take List.

1. Press the HDD key to access the Take List.
2. Scroll to the top of the Take List and highlight the next take, which is indicated by the letter n.

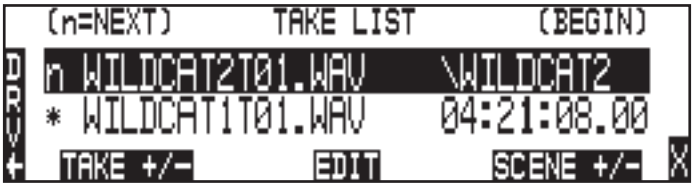


3. Press the soft Scene +/- (Fast Forward) key to enter the Scene increment/decrement screen.

4. Press the soft Scene + (Fast Forward) key to increment the scene name from WILDCAT1T02.WAV to WILDCAT2T01.WAV.

5. Press the soft Done (Play) key.

6. The name of the next take will be displayed on the top line indicated by the n.



Take Numbers

Take numbers are integers between **01** and **99,999**, with or without preceding zeros, which increase by one each time a new file is recorded. Take numbers can be set with or without a take separator, such as the character "**-**" or "**T**". The take separator can be used to clearly identify the take number within the file name. Take numbers are managed in the Setup Menu option **REC: TAKE NAME/NUMBER**. Take numbers can be incremented and decremented in the Take List.

If the 788T detects a take/file with the same name in the destination folder, a letter suffix, starting with "**A**" is added to the take/file name, before the extension.

To change take numbers:

1. Enter the Setup Menu and navigate to the Take Name/Number option.
2. Use the REWIND (<<) and FAST FORWARD (>>) soft keys to move among decimal places and to jump to the single alphanumeric take spacer character. Use the PLAY key to reset the take number to 1. Characters are entered from left to right and deleted from right to left.
3. The Multi-Function Rotary Switch or the soft keys are used to choose characters/numbers. Press the soft Check Mark (TONE) key or press in on the Multi-Function Rotary Switch to save the character and move to the next position.

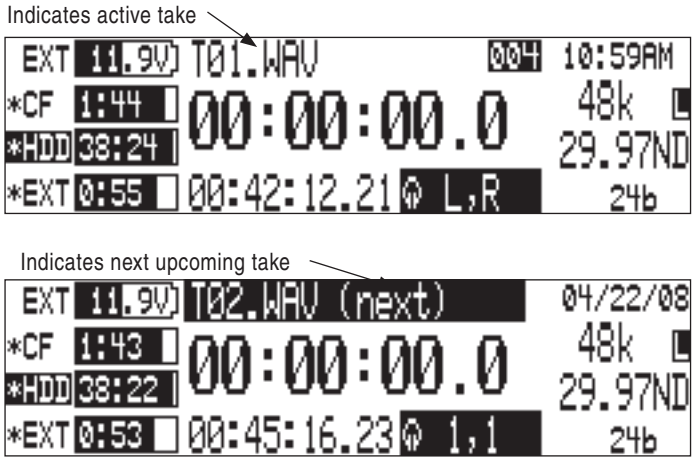
From the Setup Menu the action for take resetting is controlled by the following options:

- **Never** – take numbers do not reset
- **When scene is changed** – take resets when scene name is changed
- **When daily folder is changed** – takes reset on new day
- **Either scene or daily**– takes reset on either change

Take Number Incrementing/Decrementing

Take increments and decrements can be made in the Take List. To increment and decrement takes.

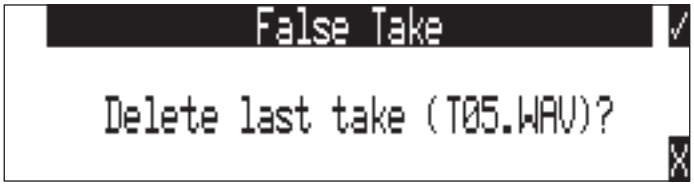
1. Press the HDD key to access the Take List.
2. Scroll to the top of the Take List and highlight the next take, which is indicated by the letter n.
3. Press the soft Take +/- (Fast Forward) key to enter the Take Increment/Decrement screen.
4. Press the soft Take + (Fast Forward) key to increment or the Take - (Rewind) key to decrement the take.
5. Press the soft Done (Play) key.
6. The name of the next take will be displayed on the top line indicated by the letter n.
7. Exit the Take List by pressing X.
8 Press and hold the STOP key to display the next incremented take's file name.



False Take Control

To identify a take as a False Take, perform the following:

1. Press the STOP key to end the recording.
2. Wait for the file to finish writing, the activity LED will turn from orange to green.
3. Simultaneously press the STOP and REWIND keys to be prompted to delete the most recent take.



4. Press the soft Check Mark (TONE) key to delete the take.

Alternatively, the last take can be identified as a False Take from within the Take List. This can be done by decrementing the take number to match the most recent recorded take's filename.

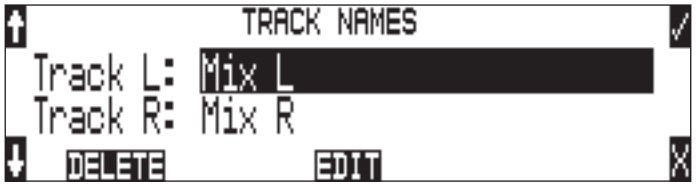
Files that have been confirmed as false takes are moved to the FALSETAKES folder. When recording to internal hard drive, CompactFlash, and external FireWire storage devices, files determined as False Takes will be moved to the FALSETAKES folder on each storage media that the file has been written to. This folder sits in the drive root. False Takes will remain on the drive until the FALSETAKES folder is emptied.

Emptying the False Take Folders

Files that have been moved to the False Take folders can be permanently deleted from each media in the Drive Options Menu by selecting **EMPTY TRASH**. Each drive has its own False Take folder and they are permanently deleted independently. Once the False Take folder has been emptied, any files it contains are permanently deleted and cannot be recovered. *See Emptying the Trash for more details.*

Track Naming

Each track in a file, whether monophonic or polyphonic, can be named with a unique, descriptive track name. Descriptive track names such as 'radio mic 1', 'boom 2' or 'John Smith' are more helpful to editors than track numbers. Track names with up to 26 characters are managed in the Setup Menu option **REC: TRACK NAMES**. The track names selected prior to recording are stored in the Broadcast Wave Extension (BEXT) data as well as in the iXML data.



Take List

All metadata edits and entries performed in the Take List and are applied across all available media that contain the select take. The Take List is accessed via the Setup Menu option **FILE: VIEW TAKE LIST** or by simply pressing the HDD key.

The File Viewer (Drive Directory) (formerly accessed by pressing the HDD key) is now accessed by pressing the soft DRV (HDD) key from within the Take List or via the Setup Menu option **FILE: VIEW FILES**.

The Take List contains a list of every Polyphonic or Monophonic take that has been recorded by the 788T. Takes must be recorded with Wildcat Beta or greater in order to view them in the Take List.

The name of the take is displayed on the left hand side of the Take List. The right hand side of the Take List displays additional file information. The type of information displayed can be toggled by pressing in on the Multi Function Rotary Switch. Each press will toggle between the following information.

- Beginning time code stamp
- Time of file creation
- Date of file creation
- Scene name
- Drives that contain the file
- Folder that contains the file

The following functions are performed within the Take List.

- Increment/Decrement Scene and Takes
- Edit metadata and rename files

Take Edit Menu

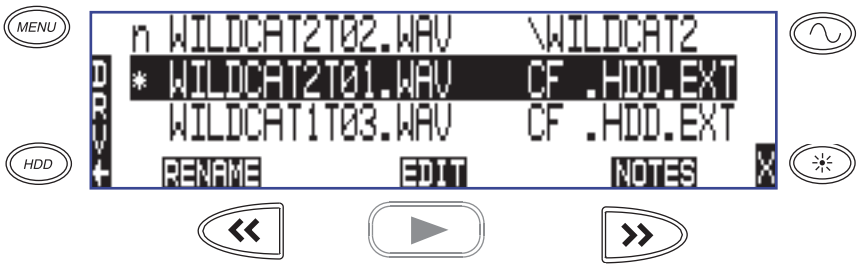
From this menu, the user can perform the following edit operations while the recorder is in Standby or Record modes:

- Notes
- Rename
- Circle
- Project
- Scene
- Take
- Tape (Roll)
- Set Copy Flag
- Clr Copy Flag
- Delete (sends file to the Trash)
- Rename Tracks

The Delete option is removed from the Take Edit menu for the take that is currently being recorded.

Follow these steps to access the Take Edit Menu.

1. Enter the Take List by pressing the HDD key.
2. Choose any Take from the Take List.
3. Press the soft Edit (PLAY) key to enter the Take Edit Menu.



Notes

Notes can be added to a Take to describe its contents. BEXT and iXML support notes fields. To add notes to a Take:

1. Enter the Take List by pressing the HDD key.
2. Highlight the desired file.
3. Press the soft EDIT (Play) key to access the Take Edit Menu.
4. Select Notes
5. Enter text in the Notes field using the Multi-Function Rotary Switch or a USB Keyboard.

6. Press the soft Check Mark (TONE) key or simultaneously press the CTRL and Enter keys from a USB Keyboard to save Notes. Pressing the soft X (LCD BACKLIGHT) key or Esc on a USB Keyboard will cancel the Notes entry.

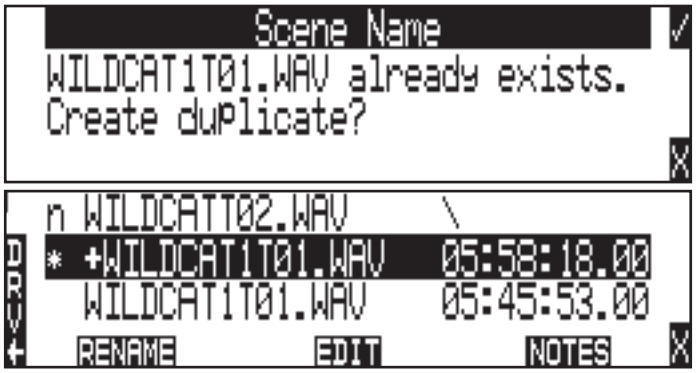
Entering notes using an external USB keyboard is quicker than the Multi-Function Rotary Switch.

Renaming Takes

Takes can be renamed in the Take Edit Menu during and after recording. Renaming a take renames its associated files and updates their embedded metadata. Edits made to the Take name are applied across all media and associated mono files. The new name can be up to 26 characters in length including the .WAV extension.

Duplicate Takes

With the ability to rename files and edit scene names directly from the 788T, it is possible to generate files with duplicate file names. In this event, the 788T will detect that a file with the same name already exists and will ask the user if a duplicate file should be created. If the user selects to do so, the resulting file name will be pre-fixed with a +. If this occurs for more than two files, an additional + will be added respectively for every file altered.



Circle Take

Take names can be altered to include the "@" symbol preceding the file name. This can be used to highlight a take as a "Circled Take". Circled Takes are often used to identify good takes for transferring. Circle Take information is also embedded within the BEXT and IXML data chunks.

To Circle or uncircle a take, perform the following steps:

1. Press the STOP key to end the recording.
2. Press the HDD key to enter the Take List.
3. Scroll among files to highlight the file as a Circled Take.
4. Press the soft EDIT (PLAY) key to enter the Take Edit Menu.
5. Highlight and select the Circle option from the list. This will toggle the Circle indication on and off.

Project

Edits can be made to the Project field during and after recording. The Project field by default is the name of the Top-Level folder defined in the Setup Menu option **FILE: FOLDER OPTIONS**. Project metadata is embedded within the BEXT and IXML data chunks.

Scene

Scene name edits can be made during and after recording. Any changes to the Scene name are applied to both the file name and the Scene tag in the iXML and bEXT chuncks.

Take

Take number edits can be made during and after recording. Any changes to the Take are applied to both the file name and the Take tag in the iXML and bEXT chunks.

Tape (Roll)

Edits can be made to the Tape (Roll) iXML tag during and after recording. The Tape (Roll) field by default is the name of the Mid-Level folder defined in the Setup Menu option

FILE: FOLDER OPTIONS. Tape (Roll) metadata is embedded within the BEXT and IXML data chunks.

Set and Clear Copy Flags

Copy Flags are useful for selecting various takes to be copied from one media to another. By default, Takes recorded by the 788T have their Copy Flag set to On. If the Setup Menu option **FILE: COPY FLAG RESET** is enabled the Copy Flags will automatically clear after the file has been copied from one media to another. *See File Copying Among Available Media.*

Deleting Takes

Takes and their associated files are now deleted from the Take List Edit Menu. Deleted files are sent to the respective media's Trash Folder. The Trash Folder is emptied via the Drive Directory Options Menu.

To send a Take to the Trash Folder.

1. Enter the Take List by pressing the HDD key.
2. Highlight the file that you wish to delete.
3. Press the soft Edit (Play) key to access the Edit Menu.

4. Highlight and select the Delete option.

5. The Confirm Take Delete window appears. Select which drives the file should be deleted from using the soft CF, HDD, and EXT (Rewind, Play, and Fast Forward) keys. The take will be deleted from any drive that is highlighted.

For example, if the file WILDCAT2T01.WAV is to only be sent to the EXT drive Trash Folder, press the soft CF and HDD (Rewind and Play) keys to deselect the drives.

6. Press the soft Check Mark (Tone) key to send the take to the Trash Folder.

Renaming Tracks

Track names can be renamed during and after recording via the Take List. To rename a track:

1. Enter the Take List by pressing the HDD key.
2. Highlight the desired take to be edited.
3. Press the soft EDIT (PLAY) key to access the Take Edit Menu.
4. Highlight and select the track that is to be renamed.
5. Rename the track and press the soft Check Mark (TONE) key to save the new track name.

File Management

The 788T, like a computer, saves audio recordings to a file system containing files and folders. The 788T formats its internal hard drive, CompactFlash cards, and attached external drives in the FAT32 format as single drives named "**788T INDD**", "**788T CF**", and "**788T EXTHDD,**" respectively.

Automatic File Splitting

While it is possible to have thousands of files on the 788T storage volume(s), the largest any single file may be is 4 GB. *See Appendix 4 – FAT32 and Maximum File Size.* The 788T automatically splits an audio file before the 4 GB size is reached (2 GB is factory default) and begins writing to a new file. When joined in an editing program, these files match seamlessly with no samples lost. Maximum File Size can be selected in the Setup Menu option **FILE: MAX SIZE** of 512 MB, 1 GB, 2 GB, and 4 GB. The 512 MB size allows the user to break an audio program into CD-R sized files for backup to inexpensive CD-R media. There is also a selection of sizes to ensure that recorded files will fit onto common CompactFlash card capacities.

File Time and Date

Similar to a computer file system, all files recorded by the 788T are stamped with the creation time and date. To ensure that accurate time-of-day and file generation dates are written for each file, make certain that the time-of-day clock and calendar are correct.

File time and date and time code are unrelated.

1. Enter the Setup Menu option **TIME/DATE: SET**.
2. Set the current time and date using the navigation below.

soft keys increment and decrement time and date, controller can be turned, as well
Time & Date Set
02:28:59 PM
04/22/08 (done)
advances to the next selection
returns to the previous selection

Once set, the time and date clock will be maintained indefinitely.

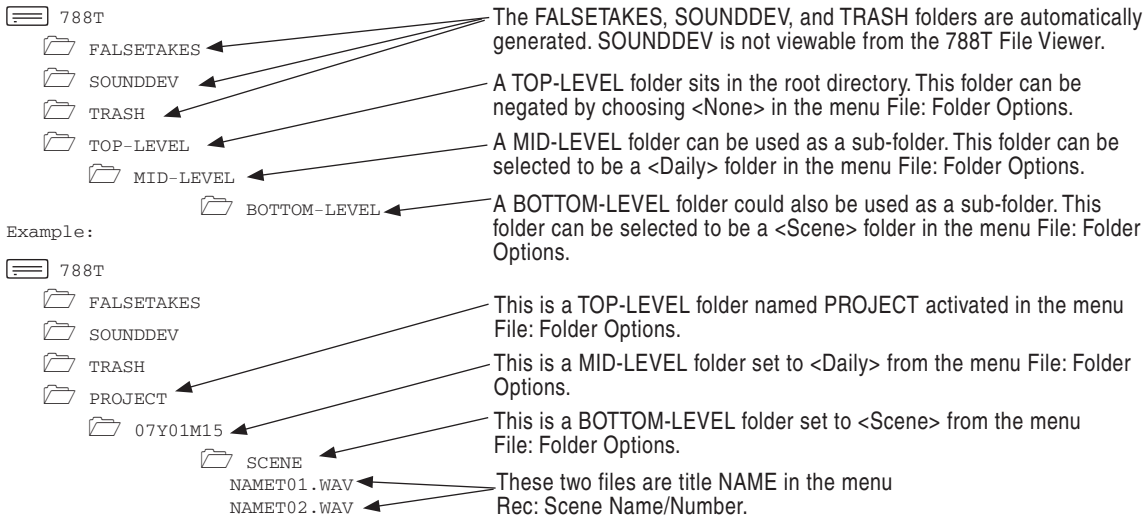
Folder Actions

All files generated by the 788T can be saved to the Root directory, a Project Folder, a Daily (Roll) Folder, or a Scene Folder (Files are saved to the Root directory by default). File organization is managed in the Setup Menu option **FILE: FOLDER OPTIONS**. Folder choices include **TOP-LEVEL**, **MID-LEVEL**, and **BOTTOM LEVEL FOLDERS**.

- **Top-Level / Project Folder** – is a root-level folder and can be set with a user-selected Project name. Use this, for instance, as the name of the movie you are working on. The name of this folder is inserted in the <PROJECT> field of the iXML and bEXT chunks. *See Appendix 2 – Metadata Implementation.*
  The Top-Level folder can also be de-activated by selecting <**NONE**> from the Setup Menu. If the Top-Level folder is not used then the next lower-level folder will reside at the drive's root. If the **TOP-LEVEL** folder is active then the **MID-LEVEL** and **BOTTOM-LEVEL** folders will be its sub-folders.
- **Mid-Level / Tape (Roll) Folder** – can be selected as a Roll folder with user-selected name or as a <**DAILY**> folder, or not used. The name of this folder is inserted in the <TAPE> (Roll) field of the iXML and bEXT chunks.
  If a **TOP-LEVEL** folder is in use, the **MID-LEVEL** folder will be a sub-folder of the **TOP-LEVEL** folder. If no **TOP-LEVEL** folder is used, the **MID-LEVEL** folder will reside at the drive's root. If set to <**DAILY**> a new folder will be created daily. When recording past midnight the 788T will prompt to make to a new daily folder.
- **Bottom-Level / Scene Folder** – can be selected as a <**SCENE**> folder which will use the name generated from the **REC: SCENE NAME/NUMBER** Setup Menu, as a user-selected name, or not used at all.
  If no upper-level folder is in use, the **BOTTOM-LEVEL** folder will reside at drive's root. If the **MID-LEVEL** and/or **TOP-LEVEL** are in use the **BOTTOM-LEVEL** folder will be a sub-folder.

Example: If a daily Folder is desired, set the **TOP-LEVEL** to **<NONE>**, the **MID-LEVEL** folder to **<DAILY>**, and the **BOTTOM-LEVEL** to **<NONE>**. This will generate a Daily Folder in the root directory with files directly inside the folder.

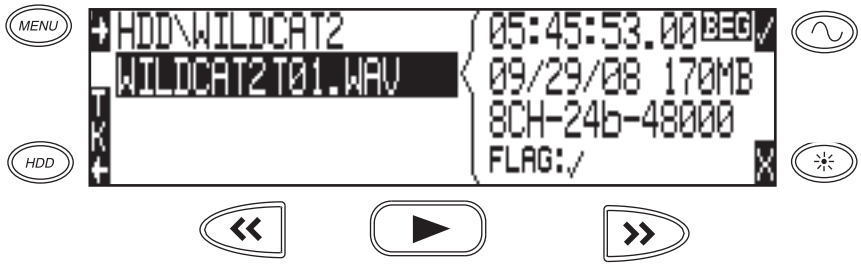
A hierarchical view of files generated by the 788T is below.


788T
FALSETAKES
SOUNDDEV
TRASH
TOP-LEVEL
MID-LEVEL
BOTTOM-LEVEL
Example:
788T
FALSETAKES
SOUNDDEV
TRASH
PROJECT
07Y01M15
SCENE
NAMET01.WAV
NAMET02.WAV
The FALSETAKES, SOUNDDEV, and TRASH folders are automatically generated. SOUNDDEV is not viewable from the 788T File Viewer.
A TOP-LEVEL folder sits in the root directory. This folder can be negated by choosing <None> in the menu File: Folder Options.
A MID-LEVEL folder can be used as a sub-folder. This folder can be selected to be a <Daily> folder in the menu File: Folder Options.
A BOTTOM-LEVEL folder could also be used as a sub-folder. This folder can be selected to be a <Scene> folder in the menu File: Folder Options.
This is a TOP-LEVEL folder named PROJECT activated in the menu File: Folder Options.
This is a MID-LEVEL folder set to <Daily> from the menu File: Folder Options.
This is a BOTTOM-LEVEL folder set to <Scene> from the menu File: Folder Options.
These two files are title NAME in the menu Rec: Scene Name/Number.

The Drive Directory (File Viewer)

From within the Drive Directory, navigate between storage media, folders, and files. View file properties and select files for playback. The Drive Directory always exits to the main LCD display whether entered from the Setup Menu or via the Take List.

The left side of the File Viewer displays storage media, folders, and files. The top line displays the directory path in the form of DRIVE\FOLDER NAME and the right side displays file or folder properties depending on what is selected on the left hand side. File and folder names are listed in the order in which they were recorded.

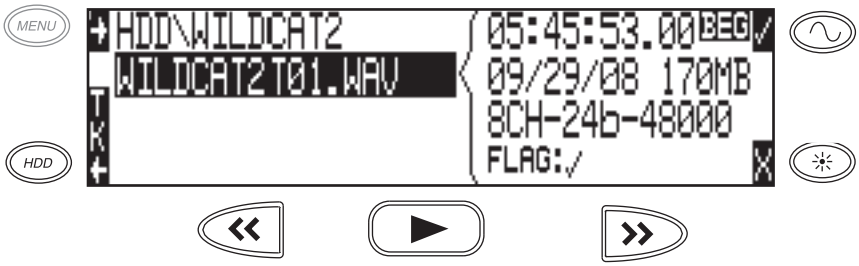


Navigation

Moving from file to file is similar to navigating among files on a computer. To access the Drive Directory perform the following:

1. From the Main screen, press the HDD key to access the Take List.
2. Press the soft DRV (HDD) key to access the Drive Directory. The Drive Directory will open immediately to the location of the last take recorded or played back. Note: For quick access to the Drive Directory from the Main Screen, simply press the HDD key twice.

3. Use the Multi Function Rotary Switch to scroll through files and folders. Select "**\..**" at the top of the list to move up one menu level. For quick access to the Root Directory press the soft + (MENU) key.



4. Select either HDD, CF or EXT and scroll down through the directory to the required file. Should CF or EXT not be connected, the media will be crossed out in the media select screen.

Larger files on slower media can take longer to display details; this is normal.
Unrecognized File types do not appear in the file viewer, although all folders are viewable.

Selecting Files for Playback

Enter the Drive Directory and navigate to the desired file for playback. Once the desired file is highlighted, press play. The 788T will playback according to what has been selected in the **PLAY: AUTOPLAY MODE** Setup Menu option. If a monophonic file is selected, the 788T will playback all associated monophonic files from the same take simultaneously. *See Playback.*

Folder Options Menu

The Folder Options Menu is accessed by pressing the soft OPTIONS (FAST FORWARD) key for any folder in the Drive Directory. Here it is possible to rename folders, set and clear copy flags, and delete folders.

Operations performed within the Drive Directory Folder Options Menu are only applied to the select media, as defined in the directory path. To apply edits across all available media, operations must be performed within the Take List. *See Take Edit Menu.*

Rename Folders

Folder names can be edited after recording has taken place. To rename a folder:

1. Enter the Drive Directory.
2. Highlight the desired folder to be renamed.
3. Press the soft OPTIONS (FAST FORWARD) key to access the Folder Options Menu..
4. Select Rename.
5. Rename the folder and press the soft Check Mark (TONE) key to save the new file name

Delete Folders

Any folder located on any of the storage media, can be deleted. Permanently deleting folders is a two-step process. Similar to Mac OS and Windows operating systems, the 788T uses a "trash" folder to temporarily hold files which have been deleted. To send a folder and all of its contents to the trash, perform the following:

1. Enter the Drive Directory.
2. Navigate to the folder to be deleted.
3. Press the soft OPTIONS (Fast Forward) key.
4. Select DELETE.
5. You will be prompted to confirm folder deletion.

The file has now been moved to the select media's trash folder and will no longer appear in the Drive Directory. It will, however, appear in the trash folder. Files sent the trash folder can still be viewed and played.

If a folder has accidentally been sent to the trash, the drive can be mounted to a computer via FireWire/USB and moved back to its original folder. Folders moved to the trash cannot be removed from the trash directly from the 788T.

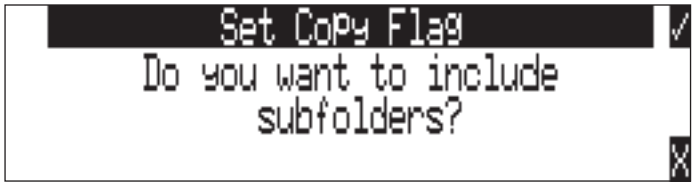
Folders deleted from the Folder Options Menu are only deleted from the select media, as defined in the directory path. To Delete files across all available media, Delete must be performed within the Take List.
See Take Edit Menu for more details.

Set and Clear Copy Flags

Copy Flags are useful for selecting various takes to be copied from one media to another. By default, Takes recorded by the 788T have their Copy Flag set to On. If the Setup Menu option **FILE: COPY FLAG RESET** is enabled the Copy Flags will automatically clear after the file has been copied from one media to another. *See File Copying Among Available Media.* Setting and Clearing Flags from the Folder Options menu only changes the Copy flag status on the select media. If changing the flag status across all media is desired, perform the Set/Clr Copy Flag operation in the Take List.

To set or clear Copy Flags from the Drive Directory:

1. Select a media or folder in the Drive Directory.
2. Press the soft OPTIONS (FAST FORWARD) key, then choose Set Copy Flag or Clr Copy Flag respectively. If the media or folder contains sub-folders, the 788T will display the following prompt:



Drive Directory Options Menu

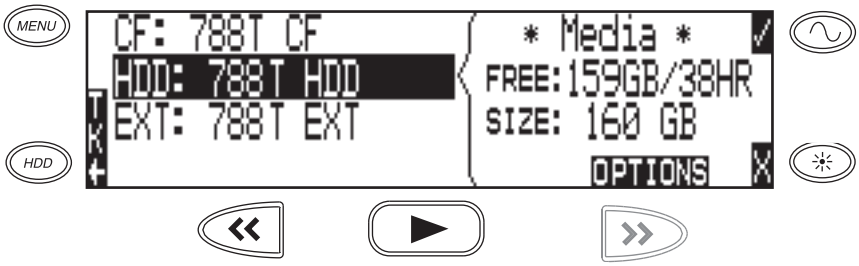
All drive specific operations are performed in the Drive Directory Options Menu, with the exception of the Drive Speed Tests. Drive Speed Tests are performed within the Setup Menu option **DRIVE: SPEED TESTS**. The following functions are performed within the Drive Directory Options Menu:

- Rename (the Drive/Folder)
- Set Copy Flags
- Clear Copy Flags
- Empty Trash (and False Takes)
- Erase (Formats the Drive)

Perform the following steps to the access the Drive Directory Options Menu.

1. Access the Drive Directory and navigate to the Root Directory. *See Navigation for additional steps.*

4. Highlight the desired Drive.
5. Press the soft Options (Fast Forward) key to access the Drive Directory Options Menu.



Emptying the Trash

Files and folders that have been moved to the Trash or False Takes folders can be permanently deleted from each media. Each drive has its own Trash folder and False Takes folder that are permanently deleted independently from the Drive Directory Options Menu.

Once the trash folder has been emptied, any files or folders it contained are permanently deleted and cannot be recovered. After the trash folder has been emptied, a prompt to empty the false takes folder is displayed.

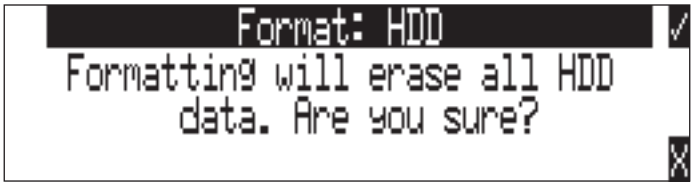
Erase (Media Format)

For best operation periodic re-formatting of the 788T media is recommended. Formatting the hard drive, Compact Flash, and external media rebuilds the FAT (file allocation table) and erases all audio and data files present on the medium. Formatting media prevents fragmentation and reduces the likelihood of directory corruption.

Be certain that all files on the drive have been backed up to another media before formatting. Once formatted, all data on the given media will be erased. Dynamic lists such as track names, scene names, folder name entries, etc... will be saved.

To format the 788T media:

1. Ensure that all data on the drive has been copied or is no longer needed.
2. Press the HDD key to access the Take List.
3. Press the soft DRV (HDD) key to access the Drive Directory.
4. Press the soft ✚ (MENU) key to access the Root Directory.
5. Use the Multi-Function Rotary Switch to highlight the desired media to be formatted.
6. Press the soft Options (Fast Forward) key to access the Drive Directory Options Menu.
7. Select the ERASE option from the list.



4. To verify that a non-recoverable format of the storage device is desired, two keys must be pressed to begin formatting. Press and hold down the PLAY key to enable the Check Mark.

5. Press the soft Check Mark (TONE) key to begin formatting.

When the operation is complete, the 788T will generate a fresh menu hierarchy. Dynamic lists such as track names, scene names, folder options, etc. will be saved.

Storage Media – Internal Hard Drive

The 788T's internal hard disk drive is the 788T's primary storage medium. The large capacity and fast data read/write speeds of hard drives are a perfect choice when long form, high data rate recording is performed. Hard disk drives offer a good balance of speed, reliability, noise performance, and current draw.

The drive installed in the 788T is formatted at the factory as a single-partition FAT32 volume. If a drive with multiple partitions is installed, the 788T will only "see" and address the primary partition.

Drive Type

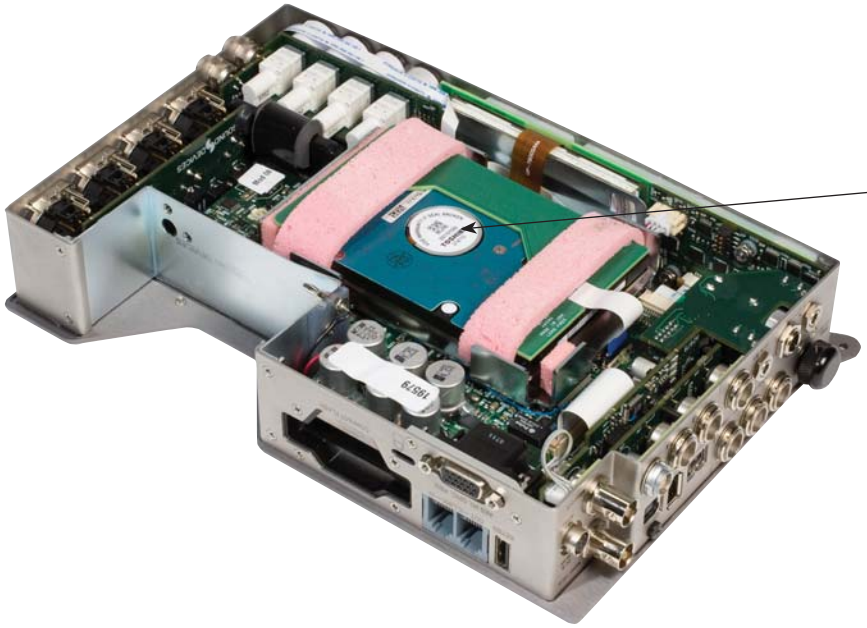
The 788T ships with a 2.5-inch, 5400 RPM hard drive with a SATA-5 interface. Sound Devices has chosen the specific mechanism for maximum vibration and shock resistance. Most 2.5 inch drives conforming to the SATA specification can be substituted for the factory hard drive. When choosing a substitute hard drive, note that higher RPM hard drives draw more current, reducing battery run time. Higher speed drives may be used with the 788T, however they will not significantly improve performance. They will slightly increase transfer throughput with the penalty of increased current draw and reduced battery run time. The 788T can address drives with capacities up to 2 TB.

Drive Replacement

The internal hard drive can be removed and replaced if the device fails or if a different capacity drive is needed. The internal hard drive is not intended to be a swappable, deliverable medium. Its multi-pin connector is not rated for repeated insertion and removal cycles and may be prone to breakage with repeated cycling.

In typical service conditions Sound Devices recommends hard drive replacement once every three years.

The hard drive is mounted to the bottom-side of the recorder's chassis and is screwdriver accessible. The drive is "suspended" in the unit with a shock absorbing foam and is attached to the main circuit board via a "flex board". Since the high-density circuitry and tight construction require specific electronics knowledge, Sound Devices strongly recommends drive replacement be performed by a qualified technician using proper ESD precautions. Drive replacement done by a qualified technician has no warranty implications.



The internal hard drive is not intended as a swappable exchange medium. The header connector is not rated for repeated removal and insertion. Only qualified service technician using proper ESD precautions should perform drive replacement.

Storage Medium – Removable CompactFlash

CompactFlash (CF) is a practical, portable storage media for audio recording. Its speed, capacity, and price continue to evolve to the benefit of portable recorders. The 788T can write to and read from CF cards as either its sole storage media or simultaneously with the internal hard drive.

When to Use CF

The key benefits of CompactFlash include:

- wider temperature range capability than hard drives
- greatly increased shock immunity versus hard drives
- convenient, portable, removable media
- ubiquitous card readers and transfer tools
- more power efficient than hard drives

Formatting

Upon insertion of an unformatted (or non-FAT32 formatted) CF card, the 788T will prompt the user to format the card. If the card is formatted as a FAT32 volume, the card will be ready to be selected. *To reformat the CF media see Erase (Media Formatting) in the Drive Directory Options Menu.* The 788T can format and use CompactFlash cards with capacities of 64 MB and greater.

Formatting the CF rebuilds the FAT (file allocation table) and erases all audio and data files present on the card. While some PC and Mac utilities can recover files immediately after formatting a CF card, consider that the files have been permanently erased. FAT32 volumes generated by the 788T may not be compatible with some consumer electronic devices, including entry-level digital cameras.

After recording has stopped, it may take several seconds for the 788T to finish "housekeeping" on CF. When preparing to remove the CF, always observe the CF activity LED. If it is lit yellow or red, wait until it turns green before removing the card. If the CF is removed while the LED is yellow or red, there is a possibility of file or FAT corruption.

Speed Testing

CF cards varied widely in their read and write throughput. Later generation "24x" and greater CF cards can reliably read and write multi-track, high sample rate audio. We recommend the use of UDMA x300 CF cards for 8-track recording. The 788T includes a drive speed test to measure the throughput speed of CF medium.

Qualified CF Cards

Sound Devices does not specifically "qualify" CompactFlash cards for use in the recorder. From our tests of numerous cards—including medium from Lexar Media, SanDisk, and Kingston Technology—newer cards in capacities from 128 MB and above will successfully operate in the 788T. Some older CF cards are known to have compatibility issues with the 788T. These cards cannot be formatted or addressed by the recorder.

The 788T also supports the use of ultra fast UDMA Compact Flash cards ideal for recording multi-channel, high data rate digital audio. The unit will support up to 2 TB of data. Small capacity cards may not format as FAT32 and may not be usable. Use the CF transfer speed test to verify that an installed card can support the needed read/write speed.

Storage Medium – External FireWire Drives

The FireWire ports on the 788T can function in either "host" mode or "drive" mode. *See File Transfer to a Computer*. In host mode, an attached FireWire storage volume such as a hard drive or DVD-RAM can be used to record and play back audio files. Because the 788T can write to all available mediums simultaneously, the ability to write to an external drive reduces the need for post-record copying of sound files.

When to Use External FireWire Drives

The key benefits of recording external drives include:

- the choice of drive types include DVD-RAM optical drives or hard drives
- near limitless storage capacity when a large volume external hard drive is attached (up to 2 TB)
- fast, no-waiting simultaneous record option
- post-record copying to quickly back up internal hard drive or CF medium

Formatting

Identical to both the internal hard drive and CompactFlash, attached FireWire drives are formatted as FAT32 volumes. Upon connection to an unformatted (or non-FAT32 formatted) external drive, the 788T will prompt the user to format the drive. If the drive is already formatted as a FAT32 volume the drive can be selected as a recording destination. The front panel drive LED will illuminate to

show which drives are available for recording. *To reformat the external media see Erase (Media Formatting) in the Drive Directory Options Menu.*

After recording to an external drive has stopped, it may take several seconds for the 788T to finish "housekeeping" on drive. This is especially true when recording to DVD-RAM disks, which generally have slower throughput than hard drives.
When preparing to disconnect a FireWire drive, always observe the activity LED labeled EX. If it is yellow, wait until it turns green before disconnecting the drive. If the drive is disconnected while the LED is yellow, there is a possibility of file or FAT corruption.

FireWire Bus Powering

The FireWire 400 and 800 ports on the 788T provides power for bus-powered FireWire drives. The following conditions should be observed when connecting to bus-powered drives.

- Bus powering a drive requires external DC powering of the 788T, however, the 788T can bus-power select lower power devices such as a CF card reader from Li-ion power. Sound Devices recommends using the supplied XL-WPH2 in-line power supply when bus-powering external storage media such as hard drives and DVD-RAM burners.
- While hot-swapping FireWire cables is possible, Sound Devices recommends making connections to bus-powered drives with the recorder turned Off.

The 788T does not support the XL-1394 FireWire Power Conditioning Cable accessory for the 702, 702T, 722, and 744T recorders. The power conditioning circuitry is integrated into the 788T's design, negating the reason for the XL-1394 accessory.

Qualified Drives

External FireWire storage volumes that can be formatted and addressed as FAT32 can be used with the 788T. These include:

- external hard drives, bus-powered or mains powered. Drives as large as 2 TB can be addressed,
- FireWire CompactFlash card readers,
- DVD-RAM drives.

FireWire drives use a variety of chipsets to perform conversion from the drive's native format (i.e. IDE) to FireWire. To check for compatibility with the 788T attach a FireWire drive and run the media speed test selected from the Setup Menu. This will write, then read a file to the drive. If the drive can perform this test then it can be used to record audio.

DVD-RAM Drives

DVD-RAM drives are essentially optical hard drives. The 788T supports recording to and playing back from DVD-RAM drives when formatted as FAT32 volumes.

When recording to DVD-RAM drives in real time, it is important to note the following:

1. Record to polyphonic file formats.
2. Use DVD-RAM drives and media that support 5X recording speeds.
3. Only record to a DVD-RAM drive when it is on a stable surface. Unpredictable results may occur if the DVD-RAM drive is moved while in operation.

File Copying Among Available Media

Audio files are easily transferred between the 788T's internal hard drive, CF, and external drives. File transfer is initiated from the Setup Menu option **FILE: COPY FILES**

The File Copy menu has numerous options for each media type:

Copy All [Media] > [Media]:
Copies all files from one media to the other.
Last 24Hr [Media] > [Media]:
Copies files created in the last 24 hours from one media to the other.
Last 48Hr [Media] > [Media]:
Copies files created in the last 48 hours from one media to the other.
Flagged [Media] > [Media]:
Copies all files with their Copy Flag set from one media to the other.

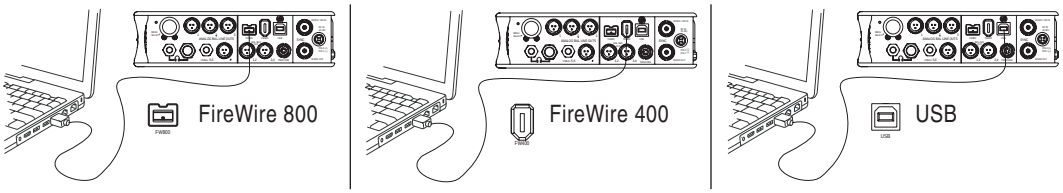
Once file copying has begun, the 788T searches the source media for the selected files. The 788T will then search the destination drive looking for duplicate file names. The LCD will report the number of files found, the number of duplicates found, and the number of files to be copied and prompt to continue.

Pressing the soft Check Mark (TONE) key or pressing in on the Multi-Function Rotary Switch begins the copy process. The LCD will report the progress of the copy operation. When file copying is complete, the 788T will report the number of files successfully copied.

Error Conditions:

If a file is too large for the destination storage media, the 788T will prompt to skip it or cancel copying. If an error occurs while copying, the 788T will prompt to cancel the transfer. When the destination storage media is full, the 788T will report the error and end the file transfer.

File Transfer to Computer



The 788T's data transfer ports makes transferring recorded files to a computer quick and easy. When connected to a computer, the 788T's internal hard drive and CompactFlash card will mount to a Mac OS X or Windows computer as a local, removable mass storage volumes. Using Mac Finder, Windows Explorer, or any other file utility, files can be copied, read, and deleted directly to and from the 788T hard drive.

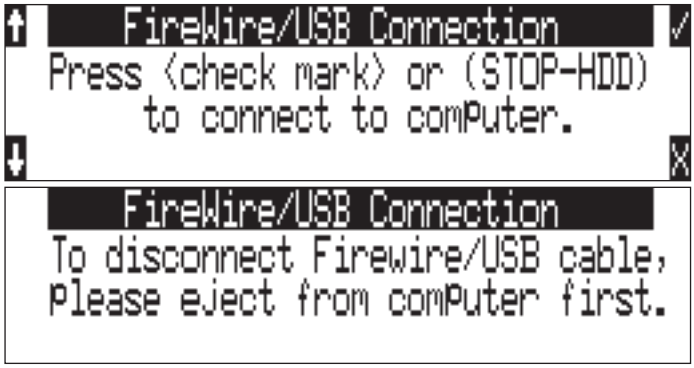
When connected to a computer for file transfer, the MENU and HDD keys are disabled. The 788T remains functional in the areas listed below, thus permitting various operations including A/D and D/A conversion, routing (mixing), recording to an external device, time code and sync generation and monitoring.

- Analog and digital I/O
- Headphone monitoring
- Metering
- Input gain controls
- Input Mutes
- Routing
- Time code
- Sync
- Battery charging

It is best practice to copy original audio files from the original recorded medium to another volume before editing.

To mount the 788T to a computer:

1. Stop all playback and recording activity.
2. Make certain the 788T battery is fully charged, or connect to external DC.
3. Connect the 788T to the host computer with a FireWire 400, FireWire 800, or USB cable. No drivers are required if the computer meets the requirements. *See Specifications.*
5. If the 788T doesn't search for the computer connection, initialize the FireWire/USB connection by selecting **FIREWIRE/USB: CONNECTION** in the Setup Menu or simply press and hold the STOP key then press the HDD key. The 788T will enter File Transfer mode, indicated by **FIREWIRE/USB CONNECTION** on the LCD display. All functions of the 788T are stopped while the 788T is connected to a computer.



6. Navigate to either the hard drive or CF card from the computer and copy all needed audio files to local storage on the computer.

To avoid possible directory corruption on the 788T hard drive, always properly dismount the unit from the operating system. On Mac platforms, drag the drive icons to the trash. On Windows platforms, use the "Disconnect External Media" icon in the system tray.

To disconnect the 788T from the computer:

1. Make certain that any software applications that reference the 788T drive are closed and that all file copy functions to and from the 788T have completed.
2. In Mac OS X highlight the drive icon on the desktop and select ⌘-e to eject the volume. Alternatively, drag the drive icon to the trash in the dock. In Windows, right-click the drive icon and select "eject."
3. The cable between the computer and 788T can now be disconnected. If a future connection is going to be made the cable can be left connected.

If the 788T is disconnected from the computer via an eject command and the chosen cable is still physically connected between the computer and recorder, the data connection can be made by entering the Setup Menu and selecting **FIREWIRE/USB: CONNECTION**. Alternatively, simultaneously press the STOP and HDD keys to begin a connection.

Do not remove the CompactFlash card while **FIREWIRE/USB: CONNECTION** *appears in the LCD.*

Powering

The 788T is powered from either removable, Li-ion rechargeable batteries or external DC power. The included, removable 7.2 V Li-ion cell can be used as a primary or backup power source. The 788T automatically chooses the power source based on the voltage level of the external power supply. If it falls below a factory-set threshold, the unit will transition to Li-ion power. The transition between external and removable battery powering is seamless and has no affect on recording or playback operation.

Run times can vary considerably from one to four hours when powering the 788T with the included 4600 mAh Li-ion battery. Run times are dependent on setup. *See Power Consumption Variables.*

Lithium Ion Rechargeable Battery

The 788T is compatible with Sony L-mount Li-ion rechargeable batteries. Numerous power capacities are available in these battery types, ranging from 1000 mAh to 7000 mAh. The 788T's mount accommodates unlimited battery depth. Larger amp-hour cells provide more run time.

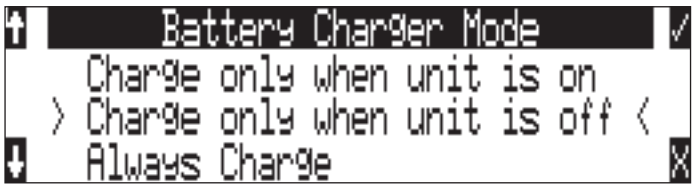
When powered by the removable Li-ion battery the LCD displays the battery voltage. The nominal operating voltage for Li-ion batteries is 7.2 V, with operating voltages ranging between 6.5–8.5 V. When the voltage drops to 6.9 V, the voltage display on the LCD will begin flashing and the power LED will also flash red to warn that the battery is nearly depleted. When the voltage reaches 6.5 volts the 788T will power down—any recordings in-process will automatically close (stop).

External Powering and Battery Charging

The 788T can be powered externally from 10–18 VDC (4 amp minimum). DC input uses a 4-pin Hirose connector (Part # HR10-7P4P). External DC fully powers the unit and charges an attached Li-ion battery simultaneously using the 788T's onboard Li-ion charger.

Pin-1 of the external DC input is at the same ground potential as chassis and signal ground.

In the Setup Menu option **POWER: BATTERY CHARGER**, the charger circuit can be set to operate only when the unit is off, only when the unit is on, always, or never.



When power is applied, the charging circuit evaluates the battery condition and supplies charging current, if necessary. Once the battery is fully charged, the charger will turn Off. Large capacity cells increase the charge time.

With an external DC source applied, the Power LED will indicate the battery charging status.

Power LED Activity	Description of Activity
Off	Unit is Off, charger is disabled
Solid Amber	Unit is Off, battery is fully charged
Solid Green	Unit is On, battery is fully charged or detached
Solid Green/Flashing Amber	Unit is On, battery is charging
Flashing Amber	Unit is Off, battery is charging

The voltage level of the source powering the unit is displayed on the main LCD screen in the upper left-hand corner (EXT 12.0V). To account for the wide variety of external powering sources available, the 788T has an adjustable external low battery threshold. Set the low voltage cutoff point in the Setup Menu option **POWER: EXT LOW BATT VOLT** according to the power source.

When the 788T senses a low voltage condition from an external DC source, dependent on the user-selectable external low battery voltage setting, the voltage level display will flash, to alert the user.

Additionally, if a charged L-Mount battery is attached the power LED will illuminate solid yellow to alert the user that the external power source is within 0.5 V of the low voltage threshold and will be switching power sources over to the L-Mount battery when the low voltage threshold is reached.

If no battery is attached, the power LED will flash red when the external power source is within 0.5 V of the low voltage threshold to alert the user that the unit will shut down automatically when the low voltage threshold is reached.

Time Code Clock Battery

The 788T has an internal lithium Ion battery to power the time code generator circuitry and time-of-day clock. When charging from external DC, this battery is charged simultaneously with the Li-ion removable L-Mount battery. If no external DC is connected, the internal Li-ion battery is charged from the removable L-Mount battery.

Accurate time code is held for four hours after power down. The 788T can be powered down and the removable battery can be removed and replaced without worry of time code jumps or inaccuracy. When the internal Li-ion Ion cell reaches a factory-set voltage, the time code generator will shut off and the time-of-day clock will take over, holding time and date indefinitely

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788T maintains accurate time code for six hours after power-down.

Auto Functions with External Powering

The 788T can perform several functions when DC power is applied and removed from the recorder. External power functionality is set in the Setup Menu option **POWER: EXT POWER FUNCTION**. Options available include:

- **Power On Unit** – unit will turn on and be ready for operation.
- **Power On and Begin Recording** – unit will power on and begin recording with the settings used when previously powered down.
- **Power On, Power Off Unit** – external DC functions as the on/off switch.
- **Power On and Begin Recording, Power Off** – unit will power on and begin recording, then turn off when power is removed.

These functions are useful when the unit is part of a production kit powered by a single power source. A single power switch can be used to power on the whole kit.

In addition to the internal record timer, the auto functions (power on/begin record/power off) can be used for more extensive unattended recording control. Using an outboard timer attached to a DC supply the 788T can be placed and activated to record events including EFX or nature, and for surveillance applications.

Power Consumption Variables

The 788T draws power from either its on-board Li-ion battery or from external DC sources. Two factors need to be considered to calculate battery runtime—battery/power supply capacity and unit power consumption. The best determination of your run time is to experiment with a given recording setup.

The 788T power consumption varies over a range between 4 W to 20 W (12 volts), depending on active functions. The following functions have the most significant affect on power consumption:

Inputs	Active inputs increase power consumption. If recording solely to input 1 and input 2, disable inputs 3-8 to reduce power consumption. Analog inputs and the microphone preamps draw current whether they are idle or active. Active inputs draw 1.5 W compared to deactivated inputs.
Hard Drive Activity	When the unit is recording to or playing back from the internal hard drive, power consumption raises by approximately 2 W. Recording to CF only will greatly reduce power consumption.
Microphone Powering	Phantom powered microphones draw power for operation. Up to 4 W can be drawn from the phantom supply.
Battery Chargers	Depending on the charge state of the on-board Li-ion, the charging circuit can draw ~10 W from external DC. When the 788T is on, the internal Li-ion time code battery is charged from the removable L-mount battery if an external DC source is not connected.. This may slightly reduce the removable battery's run time.
Meter Brightness	The LED brightness can be lowered to conserve power.
LCD Backlight	The backlight can be defeated to conserve power.

Firmware Upgrades

The 788T uses upgradable EEPROM (electrically erasable programmable read-only memory) to hold its operating software, or firmware. Firmware is the source code which controls all aspects of the device, including: menu options, signal routing, signal processing, LED's, keys, and switches, and data ports.

Version Information

During manufacturing the hardware revision number and serial number are burned into a protected area of the EEPROM and cannot be altered. The serial number, FireWire (IEEE-1394) revision, and current firmware revision can be viewed in the Setup Menu option **INFO:VERSION.**

The 788T firmware version and unit serial numbers are written to the data chunk of every WAV audio file generated by the 788T.

Upgrading Firmware

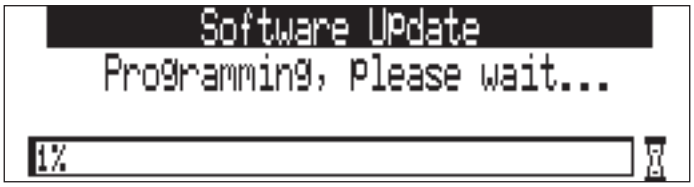
From time to time, Sound Devices may issue revisions (new versions) of firmware for the 788T. Firmware is user-upgradeable. To upgrade firmware follow these steps.

1. Download the firmware file from the Sound Devices web site.
2. Transfer the firmware file (it will be named **VERSION _ NUMBER.PRG**) to the 788T internal hard drive via FireWire/USB or onto a CF card. If there are multiple firmware files on the media, the 788T will indicate the firmware file listed to apply. To prevent confusion, ensure that there is only one firmware file available on either 788T media.
3. Enter the Setup Menu option **UPDATE SOFTWARE**. You will be prompted to search for the firmware file.

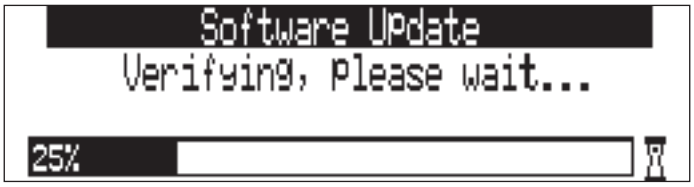
4. If a valid firmware file is present on either the internal hard drive or CF the recorder will prompt if the path is the proper file to use. Press the Multi-Function Rotary Switch or the soft Check Mark (TONE) key to say yes.

5. To verify that the PRG file selected is correct, the 788T will ask "Are you sure?" Press the Multi-Function Rotary Switch or the soft Check Mark (TONE) key to say yes.

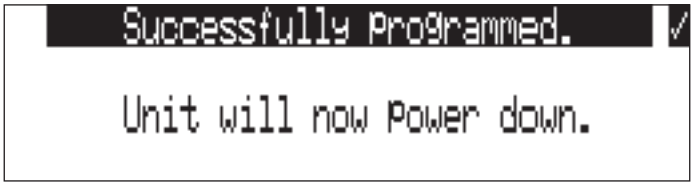
6. The 788T will begin to program the firmware upgrade. Progress is indicated with a bar graph.



7. The 788T will automatically verify that the software update was a success.



8. When the programming and verify process is complete, the 788T will prompt to power cycle. Press the Multi-Function Rotary Switch or the soft Check Mark (TONE) key to power down the 788T.



9. After the 788T shuts down completely, press the PWR key.
10. Verify the firmware version using the Setup Menu option **INFO: VERSION**.
11. Verify any recording parameters.
12. It is best practice to download the latest user guide from the Sound Devices web site, since the changes to functionality are documented.

Firmware upgrades usually preserve all user Setup Menu settings. However, save a snapshot of the settings to a Setup file on the hard drive or CF. After upgrading the firmware, restore settings from this file, if necessary. Some firmware updates may make changes to user setups; verify all user setups after an upgrade.

Remote Control

The 788T provides remote control functionality using a USB keyboard, Logic Input/Output via the rear panel DE-15 connector, or the Sound Devices CL-1 Remote Roll Accessory. The USB Keyboard Input is available to plug in a standard USB keyboard to control the 788T.

Front panel controls and menu selections on the 788T can be mapped to keyboard shortcuts, allowing for full keyboard control of the recorder. Sound Devices has tested and recommends the following USB Keyboards:

- A4Tech KL-5UP (http://www.a4tech.com)
- Kensington K64366 (http://us.kensington.com)
- Adesso ACK-595U (http://www.adesso.com)

Keyboards with internal USB hubs do not function with the 788T.

Keyboard Assignments

Menu Keys

Standard keyboard shortcuts have been pre-assigned and are listed below.

Shortcut Key	Function
Escape	Cancel – Exits without saving in all menus
Enter	Ok – Saves and exits in all menus (Check Mark or Edit)
Up Arrow	Mirrors the LCD Up Arrow in all menus
Down Arrow	Mirrors the LCD Down Arrow in all menus
Left Arrow	Mirrors the LCD REWIND Arrow in all menus Custom Route User Interface – Un-assign Route Time Menu – Moves to previous field
Right Arrow	Mirrors the LCD FAST FORWARD Arrow in all menus Custom Route User Interface – Assign Route. InRoute User Interface – Edit if on 'Custom Route' File User Interface – Selects Options for Folders/Files when displayed Shortcut Edit User Interface – Edit shortcut if on shortcut number Scene/Track Lists – Edits (Same as pressing the Play key) Time Menu – Moves to next field.
CTRL + Up Arrow	Setup User Interface Menu: Moves to the previous category
CTRL + Down Arrow	Setup User Interface Menu: Moves to the next category
Page Up	Setup User Interface Menu: Moves to the previous category or marker
Page Down	Setup User Interface Menu:- Moves to the next category or marker Shortcut Edit User Interface Menu: Same as Enter
Home	Setup User Interface Menu: Moves to the top of the list. File User Interface: Moves to the top of the list Shortcut Edit User Interface : Goes to first shortcut number or Hot Key String User Interface: Goes to the beginning of the string
End	Setup User Interface Menu: Moves to the bottom of the list. Shortcut Edit User Interface: Goes to last shortcut number or Hot Key String User Interface: Goes to the end of the string being edited
Delete	Scene/Track Lists: Deletes entry when permitted String User Interface: Deletes character when permitted
Insert	Setup User Interface Menu: Toggles Markers String User Interface: Inserts a space when permitted

"Hot Key"	Shortcut Edit User Interface Menu: Selects Hot Key In Set Key Mode Global: Executes Command if function is assigned to Hot Key
01 - 99 (number sequence)	Setup User Interface Menu: Jumps to menu list number. Shortcut User Interface Menu: Jumps to shortcut number.

String Edits & Take Name/Number (Renaming & Notes)

Hot Key	Function
ASCII Characters	Scene: Inserts and moves to next character. Take – '0-9' – Inserts Number, 'A-Z' – Inserts space character
Backspace	Deletes the previous character and moves one character to the left
Delete	Deletes the currently selected character Take: Same as 'Reset' (PLAY key)
Enter	Carriage Return if permitted, otherwise Ok: Saves and exits
CTRL + Enter	Ok: Saves and exits. (Only when Carriage Return is permitted.)
Insert	Inserts a space character when permitted
Escape	Cancel: Exits without saving in both menus
Up Arrow	Increment Character in both menus
Down Arrow	Decrement Character in both menus
Left Arrow	Previous Character in both menus
Right Arrow	Next Character in both menus
Home	Goes to the beginning of the string being edited
End	Goes to the end of the string being edited

Assignable Shortcuts

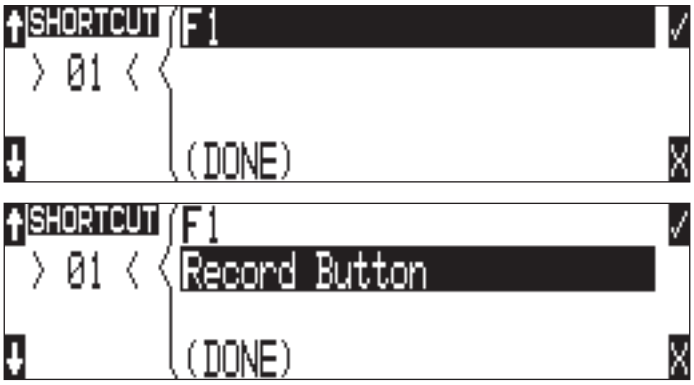
Keyboard shortcuts can be programmed to control nearly every function on the 788T. Shortcuts can select and change menu items with simple key strokes. Combinations of keyboard function keys, along with Control-, Alt-, and Shift- can also be programmed. The following chart shows what keys and key combinations are programmable.

Hot Key	Key	Shift-	Ctrl-	Alt-
F1-F12	X	X	X	X
0-9	-	-	X	X
A-Z	-	-	X	X

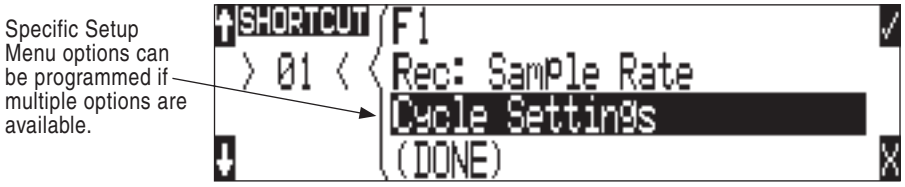
To program a shortcut perform the following steps:

1. Enter the **KEYBOARD/LOGIC IN: ASSIGN** Setup Menu selection.

2. Select an unassigned shortcut number for programming. If a duplicate key sequence is selected the lowest shortcut number action takes place. The example below shows the F1 key being reprogrammed.



3. After selecting a key sequence, select the desired Setup Menu item or action. The example below shows the reprogramming of the F1 key to change the sampling rate to the next setting in the list.



If a single key or key combination is programmed for multiple shortcuts, the shortcut with the lowest number will take precedence.

Shortcut List Functionality

The shortcut list is a user definable list of keyboard keys/Logic In that perform specified actions. The actions that a keyboard key can perform are listed in the below table.

Action	Function
Momentary Key	Simulates selected button. Can simulate in any menu
Toggle Key	Toggles the state of selected key. Only Play and Record are supported
Open Menu	Opens a SetupUI Menu
Cycle Settings	Cycles a SetupUI parameter to the next setting and saves it
Set Settings	Sets a SetupUI parameter to the given setting and saves it
Open Time Code Menu	Opens the TimeCode: Jam Menu and goes to the given parameter
Jam Time Code Item	Jams given TimeCode parameter
Edit Time Code Item	Opens the TimeCode: Jam Menu Edit screen for the given parameter
Key Shortcuts	Simulates a front panel key shortcut. Ex: (Stop+Play) opens TakeList Menu

Logic In

The Logic Input enables external devices to initiate functions on the 788T. This is commonly used for "remote rolling" using a mixing console with a record control.

The function assigned to the logic input is set in the Setup Menu option **KEYBOARD/LOGIC IN: ASSIGN**. Almost any 788T function can be assigned. The default function is RECORD.

Connect pin-9 of the rear panel DE-15 connector to the required logic output of an external remote control or mixer. *See Connector Pin Assignments.* The 788T function is triggered when a low voltage appears on pin-9. High and Low are defined as follows:

- **Low Input = 0.8 V or lower**
- **High Input = 2.0 V or higher**

Logic Out (Record Tally)

The 788T provides a record tally output via the Logic Output pin on the rear panel DE-15 connector. *See Connector Pin Assignments.* This can be used to initiate an external recording or logging device, for providing a record tally signal back to an external mixer or for driving an external Record LED or relay directly via a suitable resistor. The Logic output is able to source or sink up to 500 mA.

The logic output pin can be set to go high or low when record is initiated on the 788T. This setting is maintained in the Setup Menu option **LOGIC OUT: ASSIGN**.

Logic Out Assign Setting	Logic Output Voltage in Record Mode (DC potential at Pin-8 of DB 15 connector referenced to Chassis Ground)
Undefined	Indeterminate
High Upon Record	4.5 – 5.5 Volts
Low Upon Record	< 0.5 Volts

CL-1 Keyboard and Remote Control Interface

The CL-1 Keyboard and Remote Control Interface is an available hardware accessory to interface with PS/2 compliant computer keyboards and enable external devices to control the 788T. When using the CL-1, front panel controls and menu selections on the 788T can be mapped to keyboard shortcuts, allowing for full keyboard control of the recorder. Additionally the CL-1 has contact closures for programming remote inputs or outputs. These are commonly used for machine control and "remote rolling" using a mixing console with transport controls.

Connecting the CL-1

1. Connect the included C. Link cable to the 788T's C. Link Input connector.
2. Connect the opposite end of the C. Link cable to the CL-1's C. Link connector.
3. Connect a PS/2 keyboard to the PS/2 connector on the CL-1.
4. Connect switches between assigned pins 1-6, pin-7 (ground), and pin-8 (+5V) on the CL-1. (*See CL-1 Logic Inputs and Outputs*)

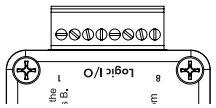
The C. Link port on the 788T provides power for CL-1 operation.

CL-1 Keyboard Interface

The CL-1 allows a user to use a PS/2 compliant keyboard to control the 788T. All functionality and setup of the Keyboard Assignments are identical to that of the USB Keyboard. *See Keyboard Assignments for more details.*

Sound Devices recommends using either a PS/2 keyboard via the CL-1 or a USB Keyboard directly into the 788T Keyboard Input, but avoid using both keyboards simultaneously.

CL-1 Logic Inputs and Outputs



Identical to shortcuts assigned to computer keyboard key sequences, the CL-1 has six contacts that can be programmed to perform Setup Menu items or control the record, play, and stop functions of the recorder. A switch connected between the assigned pin and ground (pin-7) will form a circuit. Closing the circuit will activate the programmed action.

The Logic pins on the CL-1 can be set individually as either a switch-closure input or a switch closure output. The inputs and outputs are "logic low" devices, meaning that to turn "on" an input, it must be connected to ground (zero volts). Likewise, when an output is "on", it puts out 0 volts and when it is "off", it puts out +5 volts.

Logic Inputs

Configured as a switch-closure input, a pin can be connected to a switch that a user has wired to assigned contact. This switch can then trigger the 788T to begin recording. Other functions can be assigned as well from the Setup Menu. The switch-closure on a given pin of the CL-1 can be thought of as just another key on the keyboard. Anything that can be assigned to a key can also be assigned to a switch.

To configure a pin as an input, navigate to **KEYBOARD/LOGIC IN: ASSIGN** in the Setup Menu. Select a new **SHORTCUT** number, then locate the Login inputs amongst the assignable keys. Choosing **CL1 LOGIC IN 1** would correspond to pin 1 on the CL-1, **CL1 LOGIC IN 2** would correspond to pin 2 on the CL-1, and so on. After a Logic input is selected, assign the desired action that the Logic input will control.

Logic Outputs

Configured as a switch-closure output, the CL-1 can drive LEDs, relays, or any other sort of device which will accept a TTL-level or similar input. For example, the CL-1 can drive a big red LED connected via a series resistor between the +5V output and a switch-closure output and light up whenever the recorder is put into record mode.

To configure a pin as an output, go to **CL-1: LOGIC OUT ASSIGN** in the Setup Menu. The Logic Pin number is on the left hand side ("00", "01", etc). Each of these pins can be assigned to undefined, Stop, Play, Record, or Pause. Note that if a pin is assigned to be both an input (via the **KEYBOARD/LOGIC IN: ASSIGN** Setup Menu) and an output (via the **CL-1: LOGIC OUT ASSIGN** Setup Menu), the pin will automatically default to an output.

Setup Menu

The Setup Menu controls a wide range of parameters for the 788T, including audio routing, record settings, and time code options. The Setup Menu is a single, flat architecture with no sub-menus, making it easy to navigate. Each menu option controls a specific parameter with several selections. The chart below shows the Setup Menu number, name, a description of the control, options available within that menu, and the factory default setting where applicable.

#	Setup Name	Description	Options	Factory Default
1	**Quick Setup**	Allows the user to quickly apply the factory default menu setup and save/ retrieve user setups to and from the INHDD or CF.	• Load User from INHDD - applies settings saved by user to INHDD • Load User from CF - applies settings saved by user to CF • Save User to INHDD - saves present state to file on hard drive • Save User to CF - saves present state to file on CF • Load Factory Settings - restores the factory default settings	
2	**FireWire/USB: Connection**	Activates FireWire/USB connection..		
3	**Rec: Sample Rate**	Sets the audio sampling frequency.	• 32 kHz • 44.1 kHz • 47.952 kHz • 47.952k F • 48 kHz • 48.048 kHz • 48.048k F	48 kHz
4	**Rec: Bit Depth**	Sets the bit depth of the recordings.	• 24 • 16 • 16 no dither	24
5	**Rec: Sync Reference**	Sets synchronization source. The 788T will sync to the chosen clock source.	• Internal • Wordclock Input • Video Sync Input • Digital Input 1,2 • Digital Input 3,4 • Digital Input 5,6 • Digital Input 7,8	Internal
6	**Rec: File Type**	Selects the file format (type) recorded.	• .wav poly • .wav mono	.wav poly
7	**Rec: Media Select**	Selects the storage media used for recording. Media is selectable even if it is not present.	• INHDD Only • CF Only • EXHDD Only • INHDD and CF • EXHDD and INHDD • EXHDD and CF • EXHDD and INHDD and CF	EXHDD and INHDD and CF
8	**Rec: Scene Name/Number**	User-defined, alpha-numeric file scene names can be pre-set and selected from a list. Scene name lists can be saved to the hard drive. Up to 9 alpha-numeric characters can be entered for the scene name. Scene name can also be left blank.	• <None> • <Add New Entry> • <Load List From INHDD> • <Save List From INHDD>	None
9	**Rec: Scene Increment Mode**	Selects which format the scene increments will use. To quickly increment a scene name press and hold the Stop key then press Fast Forward.	• Disabled • Character (A,B,C...) • Numeric (1,2,3...)	Numeric (1,2,3...)

#	Setup Name	Description	Options	Factory Default
10	**Rec: Track Names**	Allows user to give tracks more descriptive names, which show up in iXML and bEXT metadata.	• Mix L • Mix R • Track A • Track B • Track C • Track D • Track E • Track F • Mix • Boom • <Add New Entry> • <Load List From INHDD> • <Save List From INHDD>	Track L = Mix L Track R = Mix R Track A = Track A Track B = Track B Track C = Track C Track D = Track D Track E = Track E Track F = Track F
11	**Rec: Take Name/Number**	Numeric, auto-incrementing number used for take identification.	<selectable alpha character + integers up to 32000, with or without preceding 0's>	T01
12	**Rec: Take Reset Mode**	Defines when take numbers are reset. Reset brings take number to <1>.	• Never - take numbers do not reset • When scene is changed - take resets when scene name is changed • When daily folder changes - takes reset on new day • Either scene or daily - takes reset on either change	Either scene or daily
13	**Rec: Pre-Roll Time**	Sets the amount of time that is recorded prior to pressing the REC key.	0–10 sec. @ 48 kHz	2 Seconds
14	**Rec: Timer Start**	Sets a specific start time/date for unattended recording. Unit must be powered.	<enter time, date>	(disabled)
15	**Rec: Timer Stop**	Sets a specific time/date to stop recording. May be used with or without the Rec: Timer Start. May be set before the Timer Start time to temporarily stop recording and then resume recording with Timer Start.	<enter time, date>	(disabled)
16	**Rec: Record Indicator**	Sets how the large display looks when the unit enters record.	• Normal Numbers • Reverse Numbers • Flash Numbers	Normal Numbers
17	**Input: Track Routing**	Allows the user to setup the routing matrix among all available inputs and tracks. There are preset routings and three custom routings available. Press and hold the STOP key then press the INPUT key repeatedly to cycle through all preset routings.	• 2 track (1:L, 2:R) • 4 track (1:L..4:B) • 6 track (1:L..6:D) • 8 track (1:L..8:F) • 1 mix (L), 7 iso • 2 mix (L,R) 6 iso • Custom Route 1 • Custom Route 2 • Custom Route 3 • Edited	Input 1 = Track L Input 2 = Track R Input 3 = Track A Input 4 = Track B Input 5 = Track C Input 6 = Track D Input 7 = Track E Input 8 = Track F
18	**Input: Linking, MS**	Selects whether the input levels are controlled independently, as stereo pairs, with or without mid-side decoding, or multiple inputs grouped together.	• Unlinked • 1-2 • 1-4 • 1-6 • 1-8 • 3-4 • 5-6 • 7-8 • 5-6, 7-8 • 1-2, 3-4 • 1-2, 3-4, 5-6 • 1-2, 3-4, 5-6, 7-8 • 1-2MS • 3-4MS • 5-6MS • 7-8MS • 1-2MS, 3-4MS • 1-2MS, 3-4MS, 5-6MS • 1-2MS, 3-4MS, 5-6MS, 7-8MS	Unlinked
19	**Input: Limiter Threshold**	Selects the threshold at which the input limiters will become active across all inputs where the input limiter has been enabled in the Input Settings Window.	-12 to -2 dBFS attenuated by .1 dB increments	-6 dBFS

#	Setup Name	Description	Options	Factory Default
20	**Input: Limiter Recovery**	Adjusts the recovery time of the limiter in milliseconds.	50 to 2000 msec adjustable in 10 msec increments	200 msec
21	**Input: Limiter Knee**	This selects the response characteristic of the limiters as the Limiter threshold is reached.	• Hard-Knee • Soft-Knee	Hard-Knee
22	**Input: Low Cut Slope**	Selects the amount of slope of the high-pass (low cut) filter. Frequency roll off point is selectable in the Input Settings Window from 40 to 320 Hz in 10 Hz increments.	• 6 dB/oct • 12 dB/oct	12 dB/oct
23 24 25 26 27 28 29 30	**Input 1: Delay** **Input 2: Delay** **Input 3: Delay** **Input 4: Delay** **Input 5: Delay** **Input 6: Delay** **Input 7: Delay** **Input 8: Delay**	Sets a digital delay for each input. Can be used to compensate for delay in various digital wireless microphone units or digital processors.	0 to 30 milliseconds, 0.1 mS increments	Input 1 = 0 mS Input 2 = 0 mS Input 3 = 0 mS Input 4 = 0 mS Input 5 = 0 mS Input 6 = 0 mS Input 7 = 0 mS Input 8 = 0 mS
31	**File: Marker Mode**	Enables the user to set cue points or begin recording a new take by pressing the REC key while in Record mode.	• Markers disabled REC key does nothing when pressed in Record mode. • New Cue Cue markers are set every time the REC key is pressed in Record mode. • New File A new file is started with each press of the REC key, the take counter is increased by one.	New File
32	**File: Max Size**	Selects the file size when the 788T will close, then start a new file. The 788T will not record a file larger than the selected size. The largest file permissible with the 788T's FAT32 file system is 4 GB	• 4 GB • 2 GB • 1 GB CF • 640 MB • 4 GB CF (3.6 GB) • 2 GB CF (1.8 GB) • 1 GB CF (950 MB) • 512MB CF (450 MB)	2 GB CF (1.8 GB)
33	**File: Folder Options**	Allows the user to organize files in root and sub-folders. For no folders, select <None> on every level.	• TOP-LEVEL (Project) <None>, <Add new entry> •MID-LEVEL (Roll) <None>,<Add new entry>, <Daily> • BOTTOM-LEVEL (Scene) <None>, <Add new entry>, <Scene>	None
34	**File: View Files**	Enters the file directory tree for the selected drive.	Highlight media descriptor to navigate the menu	
35	**File: View Take List**	Allows the user to view the last 200 takes. Takes can be designated as Circled Takes or False Takes from the Take List.	• Take - • Take + • Circle	
36	**File: Copy Files**	Allows the user to select a file or a range of files to be copied from one storage media to another. Files will only be copied from their current directory to a directory of the same name on the other media. If a file will not fit on the destination media, the user is given the option to skip that file and continue with the copy or abort copying all together. After the copy process has been completed, the recorder will display how many files were successfully copied.	• Copy all {drive} → {drive} • Last 24 hr {drive} → {drive} • Last 48 hr {drive} → {drive} • Flagged {drive} → {drive} All files, when recorded, automatically have their flag bit set to "on"	

#	Setup Name	Description	Options	Factory Default
37	**File: Copy Flag Reset**	Selects whether the flag bit is cleared or not on files copied from one media to another.	• Disabled • Enabled	Enabled
38	**Time Code: Frame Rate**	Sets the time code frame rate. All common time code frame rates are available.	• 23.976 • 24 • 25 • 29.97 • 29.97DF • 30 • 30DF • 30+	30
39	**Time Code: Mode**	Sets the mode for the time code generator	• Off • Free Run • Free Run - Jam Once • Record Run • 24 Hr Run • Ext TC • Ext TC/cont • Ext TC-Auto Record • Ext TC/cont-Auto Record	Free Run
40	**Time Code: Hold Off**	Sets the duration that a valid time code signal has to be recognized by the 788T before generating a new take while in Ext TC-Auto Record and Ext TC/cont-Auto Record modes.	0.0 to 8.0 seconds adjustable in increments of .1 seconds	2.0 sec
41	**Time Code: User Bits**	Sets the time code user bits generated by the 788T. mm – month dd – day of week yy – year tt – take number uu – user-defined	• Not Used – user bits are not set or output • mm:dd:yy.tt • dd:mm:yy.tt • uu:uu:tt:tt – user bits are set to 4 user definable digits with 4 take digits • uu:uu:uu:uu • tt:tt:tt.tt – user bits are set to the take counter for all 8 digits • mm:dd:yy:uu • dd:mm:yy:uu	mm:dd:yy.tt
42	**Time Code: Jam Menu**	Allows the user to jam or edit the internal time code generator and user bits. (Also accessible by pressing HDD and MENU keys simultaneously).	• Jam RX TC • Jam Zeros • Jam Value • Edit Value • Edit U-Bit	
43	**Time Code: Display Mode**	Selects the source of the large numerical display.	• Big A-time • Big time code	Big A-time
44 45 46 47 48 49	**Output 1: Source** **Output 2: Source** **Output 3: Source** **Output 4: Source** **Output 5: Source** **Output 6: Source**	Selects the signal source for the each of the 6 analog and digital outputs.	• Input 1 • Input 2 • Input 3 • Input 4 • Input 5 • Input 6 • Input 7 • Input 8 • Track L • Track R • Track A • Track B • Track C • Track D • Track E • Track F	Output 1 = Track L Output 2 = Track R Output 3 = Track A Output 4 = Track B Output 5 = Track C Output 6 = Track D
50 51 52 53 54 55	**Output 1: Analog Gain** **Output 2: Analog Gain** **Output 3: Analog Gain** **Output 4: Analog Gain** **Output 5: Analog Gain** **Output 6: Analog Gain**	Sets the attenuation level of each analog output bus.	Selectable from -20 to 0 dB in 1 dB increments	Output 1 = -4 dB Output 2 = -4 dB Output 3 = -4 dB Output 4 = -4 dB Output 5 = -4 dB Output 6 = -4 dB
56	**Digital Input: AES42 Power**	Provides +10 V of Digital Phantom Power to each digital input.	• Disabled • Enabled	Disabled

#	Setup Name	Description	Options	Factory Default
57	**Digital Output: Mode**	Selects whether or not the consumer SPDIF bit is applied or not in the AES3id output.	• Consumer • Professional	Professional
58	**Play: AutoPlay Mode**	Allows the user to play file(s) consecutively from a select directory, one time through or continuously. Great for playing an MP3 collection during down time!	• Disabled • Play all • Repeat one • Repeat all	Play all
59	**Time/Date: 12/24 Hr**	Selects between 12- and 24-hour formats.	• 12 hr • 24 hr	12 hr
60	**Time/Date: Date Format**	Selects the date syntax of the recorder.	• mm/dd/yy • dd/mm/yy	mm/dd/yy
61	**Time/Date: Set**	Sets the internal date and time of the 788T. Resetting the time re-jams the internal time code generator to the set time. Setting the internal clock during a production day will require time code devices to be re-jammed.	<time, date> Clock is not set until <done> is selected	
62	**LCD: Contrast**	Adjusts the contrast level of the LCD display.	0–100%	50%
63	**LCD: Backlight Mode**	Enables or disables the LCD backlight color from indicating that the 788T is in Record, Playback, or Standby.	• White/Green/Red • Red on Record Only • Green on Play Only • White Only	White/Green/Red
64	**Meter: Ballistics**	Selects among three different meter ballistics settings	• VU only • Peak only • Peak + VU	Peak + VU
65	**Meter: Peak Hold Time**	Adjusts the duration for which the peak LED stays illuminated.	0 to 5 seconds adjustable in increments of .1 sec	0 seconds
66	**Meter: Input Peak Threshold**	Sets the level in which the Input Activity Ring LEDS will illuminate red.	Selectable from -1 to -20 dBFS in 1 dB increments	-3 dBFS
67	**Meter: Input LED Ring Mode**	Enables or disables Input Activity Ring LEDs by color.	• Red and Green enabled • Red only enabled • Green only enabled • Red and Green Off	Red and Green enabled
68	**Meter: Stealth Mode**	Enables the LEDs to toggle On and Off with the LCD BACKLIGHT key.	• Off • On	Off
69	**HP: Rotary Switch Function**	Selects the function activated when the Multi-Function Rotary Switch is pressed in while in Record and Playback.	• Disabled: pressing in on the switch, makes no change to the headphone matrix. • Selects Favorite Mode: in Record and Playback, pressing in on the switch will change the headphone source immediately to the favorite selected in HP: Favorite Mode. • Playback Drive Select pressing in on the switch toggles between the available storage media for Playback.	Selects Favorite Mode

#	Setup Name	Description	Options	Factory Default
70	**HP: Monitor Modes**	Selects the modes and the sequence in which they appear in the Headphone Source Display.	Inputs 1,2 Inputs 3,4 Inputs 5,6 Inputs 7,8 Tracks L,R Tracks A,B Tracks C,D Tracks E,F Input 1,1 Input 2,2 Input 3,3 Input 4,4 Input 5,5 Input 6,6 Input 7,7 Input 8,8 Track L,L Track R,R Track A,A Track B,B Track C,C Track D,D Track E,E Track F,F Inputs 1,2 (MS) Inputs 3,4 (MS) Inputs 5,6 (MS) Inputs 7,8 (MS) Tracks L,R (MS) Tracks A,B (MS) Tracks C,D (MS) Tracks E,F (MS) Inputs 1-4, 1-4 Inputs 1-6, 1-6 Inputs 1-8, 1-8 Tracks LA, RB Tracks LAC, RBD Tracks LACE, RBDE Tracks LRAB, LRAB Tracks LRABCD, LRABCD Tracks LRABCDEF, LRABCDEF Tracks LR, LR Tracks LRA, LRA Tracks LRB, LRB Tracks LRC, LRC Tracks LRD, LRD Tracks LRE, LRE Tracks LRF, LRF Input B-format stereo Track B-format stereo	1) Tracks L,R 2) Tracks L,L 3) Tracks R,R 4) Tracks A,A 5) Tracks B,B 6) Tracks C,C 7) Tracks D,D 8) Tracks E,E 9) Tracks F,F 10) Tracks LACE, RBDF 11) Inputs 1,2 12) Inputs 3,4 13) Inputs 5,6 14) Inputs 7,8 15) Input 1,1 16) Input 2,2 17) Input 3,3 18) Input 4,4 19) Input 5,5 20) Input 6,6 21) Input 7,7 22) Input 8,8 23) Inputs1-8, 1-8
71	**HP: Favorite Mode**	Selects the audio source monitored when the Multi-Function Rotary Switch is pressed during Record or Playback.	Any of the HP: Monitor Modes can be selected as the HP: Favorite Mode. See the above chart for options.	Tracks L,R
72	**HP: Playback Mode**	Selects the audio source sent to the headphones during Playback.	• No change • Same options listed in HP: Monitor Modes	Tracks L,R
73	**HP: Warning Bell Level**	Sets the output level of the warning bell.	off, –60 to –12 dBFS in 1 dB steps	-30 dBFS
74	**HP: Rec/Stop Bell**	Alerts the user with one beep at the start of recording and two beeps when the recording is stopped	• Disabled • Enabled	Enabled
75	**HP: Power Up Gain**	Selects the level at which the headphone gain level will be set upon power up.	• Last Gain • Midpoint Gain (0 dB) • Off	Last Gain
76	**Tone: Level**	Sets the reference tone's output level.	–40 to 0 dBFS in 1 dB steps	-20 dBFS
77	**Tone: Frequency**	Sets the tone oscillator frequency.	100–10,000 Hz in 100 Hz steps	1000 Hz
78	**Tone: Mode**	Selects the reference tone's destination(s).	• Disabled • To record tracks only • To outputs only • To record tracks and outputs	To record tracks and outputs
79	**Drive: Speed Tests**	Performs a write/read speed test on the internal hard drive, CompactFlash, and external drives. Data transfer speed is measured in KB/s.	Caution: Drive test will disable processing and mute outputs for duration of test. Outputs will not return until test is exited.	
80	**Balance Cal**	Calibrates the center position of the even channel (2,4,6,8) pots when used as the balance control for MS recording.	Place balance control to center and press to select.	
81	**Power: Ext Low Batt Volt**	Sets the external low battery warning point. The internal low battery level is not user-adjustable.	10.0–18.0 VDC, 0.1 V steps	10.0 Volts

#	Setup Name	Description	Options	Factory Default
82	**Power: Ext Power Function**	Controls the behavior of the unit when power is applied to the external DC jack.	• Do Nothing • Power On Unit • Power On and Start Record • Power On/Off unit • Power On/Off unit and Record	Do Nothing
83	**Power: Battery Charger**	Determines when the Sony L-Mount will charge when connected to external power.	• Off • Charge only when unit is on • Charge only when unit is off • Always charge	Always charge
84	**Keyboard/Logic In: Assign**	Define functionality and keyboard shortcuts when using the USB keyboard and Logic Input.		
85	**CL-1: Reprogram**	The CL-1 has its own firmware which is supplied from the 788T. This utility updates the CL-1 firmware.		
86	**CL-1: Logic Out Assign**	Each logic output pin can be assigned to go high when the unit is in the selected mode. Logic input overrides logic output selection.	• Undefined • Stop • Play • Pause • Record	Undefined
87	**CL-1: Keyboard: Language**	Select the language of the keyboard attached to the CL-1.	• English • German • French	English
88	**Logic Out Assign**	Defines Logic Output behavior . Logic input overrides logic output selection.	• Undefined • High Upon Record • Low Upon Record	Set High On Record
89	**Info: Button Shortcuts**	An informative menu showing the available keyboard shortcuts.		
90	**Info: Version**	Shows the current firmware revision, 1394 revision, and serial number of the unit.		
91	**Update Software**	Used to install new firmware. It will search both internal hard drive and Compact Flash media for the firmware file and prompt to update.		

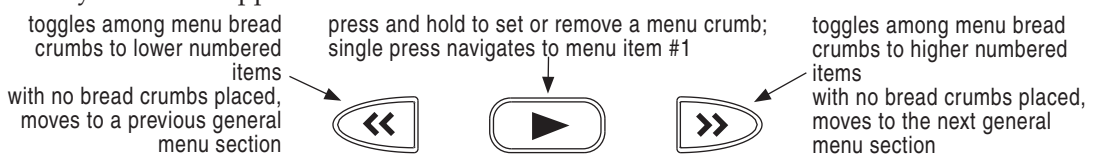
User Setup Data File

User settings can be saved to the internal hard drive or to a CF card. Save and recall user setup files in the Setup Menu option **QUICK SETUP.** User setups are saved as binary files with the name **788T.SUP** and are located in the SOUNDDEV folder of the select media.

Scene, Track, and Folder Names entered by the user, are not saved in the **788T.SUP** *file.*

Setup Menu Shortcuts

The Setup Menu can be quickly navigated by using the Multi-Function Rotary Switch to scroll up and down through the menu. Additionally, shortcuts, or "bread crumbs" can be placed on often-used menu items. A bread crumb is set by holding the PLAY key. A small dot is shown to the left of the Setup Menu number. Any number of bread crumbs can be set, but their utility is reduced when too many have been applied.


toggles among menu bread crumbs to lower numbered items
with no bread crumbs placed, moves to a previous general menu section
press and hold to set or remove a menu crumb; single press navigates to menu item #1
toggles among menu bread crumbs to higher numbered items
with no bread crumbs placed, moves to the next general menu section

Front Panel Button Shortcuts

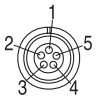
To speed navigation the 788T has numerous navigation "shortcuts". For combinations, press and hold down the first identified key then press the next identified key(s).

Function	Key Sequence	Action
Record Tone	REC + ~	**REC + TONE** While recording hold the REC key and press then press the TONE key. Tone will be active as long as the TONE key is held. Markers must be disabled in the Setup Menu option File: Marker Mode.
Jam Menu	MENU + HDD	**MENU + HDD** Enters the Time Code Jam Menu.
Button Lock	☼ + ~	**LCD BACKLIGHT + TONE** Press the LCD BACKLIGHT then the TONE key to lock all front panel buttons except for the REC, STOP and PLAY keys. FAST FORWARD and REWIND keys are available in Playback mode. Use the LCD BACKLIGHT and TONE keys again to unlock the panel.
Input Routing	■ + INPUT	**STOP + INPUT** Press and hold the STOP key and press the INPUT key to cycle through input routing presets and custom routings.
Connect FireWire	■ + HDD	**STOP + HDD** Initiates FireWire/USB connection.
False Take	■ + «	**STOP + REWIND** Delete last take prompt.
Scene Increment	■ + »	**STOP + FAST FORWARD** Increments Scene Name to be recorded for the next file.
Take List	HDD	**HDD** Press once to enter the Take List. Press twice to enter the Drive Directory.
Toggle Drives	HDD	**HDD** Hold the HDD key down for 1 second to toggle between viewable drives.
LED Level	☼ + Rotary Switch	**LCD BACKLIGHT + Multi-Function Rotary Switch** Adjusts level of LED brightness.
Flashlight Mode	« + ▶ + ■	**REWIND + PLAY + STOP** With the unit powered down, hold down these keys while powering the unit to enter Flashlight mode. This illuminates all LEDs. Press the PWR key again to exit.

Connector Pin Assignments

Each connector type, electrical characteristics, and pin assignment is shown below.

Connector		Pin Assignments	Notes
XLR **Analog Inputs 1-4**		1 – ground 2 – signal (+) 3 – signal (-)	3.3k ohm input impedance, Mic- and Line-level active-balanced
TA3M **Analog Inputs 5-8**		1 – ground 2 – signal (+) 3 – signal (-)	3.3k ohm input impedance, Mic- and Line-level active-balanced

Connector		Pin Assignments	Notes
TA3M Analog Outputs 1-4		1 – ground 2 – signal (+) 3 – signal (-)	200 ohm output impedance, active balanced. For unbalanced connection, pin-1 ground, pin-2 (+) positive, pin-3 (-) negative. Mates with Switchcraft TA3F-type connector.
3.5 mm Analog Output 5,6		tip – signal L ring – signal R sleeve – signal ground	Mates with 3.5 mm TRS jack. Signal is unbalanced.
TA3M AES Outputs 1-4		1 – ground 2 – signal (+) 3 – signal (-)	Mates with TA3F-type connectors., 110 ohm, transformer-balanced
3.5 mm Headphone		tip – signal L ring – signal R sleeve – signal ground	Mates with 3.5 mm TRS jack.
1/4-inch Female Headphone		tip – signal L ring – signal R sleeve – signal ground	Mates with 1/4-inch TRS jack.
5-pin LEMO Time code		1 – ground 2 – SMPTE TC In 3 – ASCII in/out 4 – tuning out 5 – SMPTE TC out	LEMO B-series connector, pin assignments as viewed on panel-mounted connector
Sync Input		center pin – signal sleeve – ground	BNC female, unbalanced, coaxial connection, 75 ohm connectors recommended
Word Clock Output		center pin – signal sleeve – ground	BNC female, unbalanced, coaxial connection, 75 ohm connectors recommended
FireWire 400 (IEEE-1394a)		center pin – signal sleeve – ground	6-pin male FireWire 400 IEEE-1394a
FireWire 800 (IEEE-1394b)		center pin – signal sleeve – ground	9-pin male FireWire 800 IEEE-1394b. Backward compatible with FireWire 400 IEEE-1394a to IEEE-1394b connections.
USB-B		center pin – signal sleeve – ground	Data transfer connection to computers only..
USB-A Keyboard Input		center pin – signal sleeve – ground	For use with USB Keyboards only. Data transfer is not supported.
C. Link In / Out			Not a telephone jack! Not active.
Hirose 4-pin DC Input		1 – ground 2 – not connected 3 – not connected 4 – DC (+)	Charging characteristics defined by user in the Setup Menu.
DE-15 Multi-Function Connector		1 – AES 3,4 Input (+) 2 – AES 1,2 Input (+) 3 – AES 5,6 Output (+) 4 – AES 7,8 Input (+) 5 – AES 5,6 Input (+) 6 – EXT DC (-) Ground 7 – EXT DC (-) Ground 8 – LOGIC Output 9 – LOGIC Input 10 – EXT DC +10V to 18V 11 – AES 3,4 Input (-) 12 – AES 1,2 Input (-) 13 – AES 5,6 Output (-) 14 – AES 7,8 Input (-) 15 – AES 5,6 Input (-)	The D-Sub connector provides 8 channels of balanced AES input, 2 channels of AES outputs, GPIO and External DC powering and is therefore ideal as a single umbilical connection between the 788T and an external digital mixer.

Specifications

System

Sampling Frequency	internal: 32, 44.1, 47.952, 48, 48.048 external clocking: 32–48.048 kHz via word clock or digital inputs AES/EBU inputs can accept signals from 32-192 kHz when sync reference = internal (SRC enabled).
Internal Data Path and Processing	32 bit, 192 dB dynamic range
A/D, D/A Converters	24 bit, 48.048 kHz maximum sampling rate
A/D Dynamic Range	123 dB, A-weighted bandwidth 120 dB, 20 Hz–22 kHz bandwidth
D/A Dynamic Range	114 dB, A-weighted bandwidth 111 dB, 20 Hz–22 kHz bandwidth
Metering	112-segment (8 x 14), sunlight-viewable, selectable peak, VU, or peak (with or without peak hold) with VU ballistics, variable brightness
Input to Output Delay	1.4 msec, from XLR Analog Inputs to all Outputs (with 0.0 Delay selected in the Setup Menu)

Analog Input

(all measurements at Fs 48 kHz, 24 bit unless noted)

Frequency Response	Mic or Line: 10 Hz–20 kHz, +0.1, –0.5 dB (gain controls centered)
THD + Noise	Mic: 0.004% max (1 kHz, 22 Hz–22 kHz BW, gain control down, –15 dBu input) Line: 0.004% max (1 kHz, 22 Hz–22 kHz BW, gain control down, +16 dBu input)
Gain (input dBu to –20 dBFS)	Mic: Off, 0 to 76 dB Line: Off, -26 to 50 dB
Input Impedance	Mic (XLR and TA3): 3.3k ohm Line (XLR and TA3): 3.3k ohm
Input Clipping Level	Mic: +8 dBu minimum (gain = 10 dB) Line: + 26 dB minimum (gain = 0 dB)
Input Topology	Mic and Line: fully electronically balanced, RF, ESD, short, and overload protected; pin-2 hot, pin-3 cold
Gain Matching	Mic/Line inputs: ±0.1 dB, channel-to-channel while linked
Common Mode Rejection Ratio	Mic: 40 dB minimum at 80 Hz
High-Pass Filters	40-320 Hz in 10Hz steps @ 6/12 dB/oct (Setup Menu selectable)
Mic Powering (each analog Input selectable)	48 V phantom through 6.8k resistors, 10 mA per mic available, menu-selected per channel in Mic- or Line-level positions
Mic/Line Input Limiters	Variable threshold -12 to -2 dBFS; Infinite:1 limiting ratio, 2 msec attack time, menu-selectable release time 50-2000 msec, menu-selectable hard- or soft-knee (soft-knee starts approximately 6 dB below setting)..

Output Analog

Line Output Clipping Level	+24 dBu, 10k ohm load
Attenuation & Resolution	0–20 dB, 1 dB increments
Output Topology	Line: fully electronically-balanced, RF, ESD, short, and overload protected; pin-2 driven hot, pin-3 driven cold; let pin-3 float for unbalanced connections.

Inputs/Outputs – Digital

AES3	Balanced AES out 1-4 on TA3 connector; Balanced AES out 5-6 on DE-15 connector110 ohm, 2 V p-p, AES and S/PDIF compatible with RCA adaptor Balanced AES in 1-8 on DE-15 connector110 ohm, 2 V p-p, AES and S/PDIF compatible with RCA adaptor
AES42	AES42 Mode 1 operating system, provides +10 V Digital Phantom Power to Digital Input pairs (menu-selectable).

Digital Storage

Internal hard drive	SATA interface 2.5-in hard drive 4200–7200 RPM supported, FAT32 formatted, up to 2 TB addressable
CompactFlash	CF type I, II, and + (microdrive) compatible, UDMA (x300) compatible, FAT32 formatted, up to 2TB addressable.
File Types	Record: WAV (AES-31 format), mono or polyphonic, at supported Fs, 24-bit or 16-bit Playback: WAV (AES-31 format), mono or polyphonic, at supported Fs, 24-bit or 16-bit MP3 @ 32, 64, 96, 128, 160, 192, 256, or 320 kb/s stereo MP2 @ 64, 96, 128, 160, 192, 256, or 320, 384 kb/s stereo
Utilities	format, speed test, and repair utility for internal HD, CF, and external drive volumes

Data Transfer / Control

FireWire 400	For connection to ext drives and computers: IEEE-1394a compliant, 6-pin FireWire, Windows 2000, XP, Vista, Mac OS 10.4+ only
FireWire 800	For connection to ext drives and computers: IEEE-1394b compliant, 8-pin FireWire, Windows 2000, XP, Vista, Mac OS 10.4+ only
USB 2.0	Slave mode only. For connection to Windows 2000, XP, Vista, Mac OS 10.4+ only
USB Keyboard Input	For connection to USB keyboards for entering notes and controlling features and functions of the 788T via user selectable keyboard shortcuts.

Time Code and Sync

Modes Supported	off, free run, record run, 24 hour run, external time code receive
Frame Rates	23.976, 24, 25, 29.97DF, 29.97ND, 30DF, 30ND, 30+
Accuracy	Holds TC clock for four hours after main battery removal; after four hours, retains time of day
Input / Output	20k ohm impedance, 0.3V p-p (–8 dBu) minimum / 1k ohm impedance, 3.0V p-p (+12 dBu)
Sync Input	Word Clock, AES3, Video (NTSC, PAL, and Tri-Level)
Word Clock Output	Square wave, running at sample rate, 3.3vp-p, 75 ohm.

Power

Power supply (batteries)	operating cell, removable 7.2 V (nominal) Sony L-type Li-ion, operational from 6.5–8.5 V, time code battery, 3.6 Li-Ion, time and date battery, 3 V coin cell
Power supply (external)	10–18 V, 1000 mA minimum, via locking 4-pin Hirose connector, use Hirose #HR10-7P-4P (DigiKey# HR100-ND) for locking mating DC connector; pin-1 (–), pin-4 (+). *See Powering*

Environmental

Operation and Storage	ambient temperature 5–55° C, relative humidity (non-condensing) <80%

Other

Tone Oscillator	100 Hz–10 kHz, variable output, assigned to tracks or outputs (menu-selectable)

Dimensions and Weight

Size	45 mm x 257 mm x 163 mm (H x W x D) 1.8" x 10.1" x 6.4"
Mass	unpackaged: 1.7 kg, (3 lbs 12 oz.) without battery

Appendix A - Recording Time Calculation

The calculation of available 788T recording time involves three factors:

- **track count** - how many concurrent audio tracks will be recorded.
- **data rate** - calculated from the sampling rate and bit depth for non-compressed audio and by bit rate for data compressed audio. Data rate determines how big the data "container" is for the audio signal (see the calculation below for determining PCM audio).
- **storage capacity** - typically expressed in GB

Uncompressed Recording Time in Track-Hours

Storage in GB (1000 MB = 1 GB)	Data Rate (bit depth/sampling rate), one track		
	16/44.1 (5.05 MB/min)	**16/48** (5.49 MB/min)	**24/48** (8.24 MB/min)
1	3.30	3.03	2.02
2	6.60	6.07	4.05
4	13.2	12.1	8.09
8	26.4	24.3	16.2
15	49.5	45.5	30.3
40	132	121	80.9
60	198	182	121
80	264	242	161.8
100	330	303	202
160	528	484	323.6

The chart above shows recording time available with the 788T. Time is expressed in hours per track (track-hours) at the specified data rate supported by the 788T. If recording two tracks, divide the track hours figure by two. Similarly for eight-track recording, divide track-hours by eight. Note that the 788T supports additional sampling rate / bit depth combinations, however, only the most common are included below.

Record Time

The chart shows that when recording 24-bit/48 kHz audio to a 40 GB hard drive, the maximum duration of available recording time is roughly 80 track-hours. If recording a stereo two-track file, this yields 40 stereo hours of record time.

Note that most storage media now quote capacity in GB using SI units, where 1000 megabytes equals one gigabyte.

PCM Audio

Uncompressed digital audio is expressed numerically by two measurements, bit depth and sampling frequency, such as 16-bit/48 kHz. These two numbers are used to compute the data rate of uncompressed audio.

Audio Data Rate = Bit Depth x Sampling Frequency

In the example below, the data rate of a single 16-bit/48 kHz audio stream is computed in megabytes per minute. Division by 1,048,576 converts from bits to megabits. Division by 8 converts from megabits to megabytes; multiply by 60 converts seconds to minutes.

((16 x 48000) / 1,048,576) / 8) x 60 = 5.49 MB/min

Appendix B – Metadata Implementation

788T Broadcast wave files include iXML (revision 1.5) data and bEXT chunk data. For bEXT and iXML-aware software applications this data is available. For applications that don't recognize bEXT or iXML, this information is ignored. The chart below details the supported metadata parameters.

- iXML: Metadata stored in the Broadcast Wave iXML chunk
- bEXT: Metadata stored in the Broadcast Wave bEXT chunk
- FMT: Metadata stored in the Broadcast Wave Format chunk

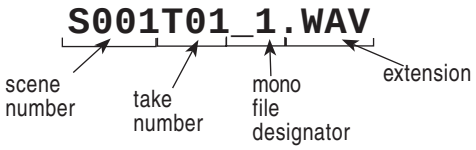
✔ = supported; blank = not supported

Metadata	Type	Notes U = Entered by User M = Automatically Entered by the Machine	Read	Write
General Information				
Project	iXML	U; via Folder Options menu	✔	✔
Roll (Tape)	iXML, bEXT	U; via Folder Options menu	✔	✔
Scene	iXML, bEXT	U; via Scene Name menu	✔	✔
Take	iXML, bEXT	U; via Take Name menu or M	✔	✔
Notes	iXML, bEXT	U; via HDD menu	✔	✔
Circle Take	iXML	U; via Take List menu	✔	✔
File UID	iXML	M; Unique File Identifier		✔
File Sample Rate	iXML, FMT	U; via the Sample Rate menu	✔	✔
Digitizer Sample Rate	iXML	U; Actual sample rate of AD converter		✔
Bit Depth	iXML, FMT	U; via Bit Depth menu	✔	✔
Channels	iXML, FMT	U; Number of channels (tracks) in the file	✔	✔
Time Code Information				
Frame Rate	iXML, bEXT	U; via Frame Rate menu	✔	✔
TC Flag (ND or NDF)	iXML, bEXT	U; via Frame Rate menu		✔
Start Time Code	iXML, bEXT	M; Stored as a sample count since midnight	✔	✔
Duration		M	✔	✔
U-Bits	iXML, bEXT	U	✔	✔
Time Code Sample Rate	iXML	M		✔
Track Information				
Channel Index	iXML	M; Track Number		✔
Interleave Index	iXML	M		✔
Track Name	iXML, bEXT	U; via Track Names menu or HDD menu	✔	✔
Speed Information				
Master Speed	iXML	M		✔
Current Speed	iXML	M		✔
Speed Note	iXML	M		✔

Metadata	Type	Notes U = Entered by User M = Automatically Entered by the Machine	Read	Write
Originator Information				
Originator	bEXT	M		✔
Creation Date	bEXT	M	✔	✔
Creation Time	bEXT	M	✔	✔
Originator Reference	bEXT	M		✔
Software Version	bEXT	M		✔
File Set Information				
Family UID	iXML	M; shared by files belonging to the same take		✔
Total Files	iXML	M; number of files representing a take		✔
File Set Index	iXML	M		✔
File History				
Original File Name	iXML	M		✔

Appendix C – File Naming

Files generated by the 788T are named using a syntax made up of four parts: scene name/number, take name/number, mono track designator (if mono file is selected), and file extension.



Monophonic WAV File Track Number Designators

When recording monophonic Broadcast WAV files each track is recorded in a separate data file. To help identify each track, each filename incorporates an underscore and track number suffix. The file of the first track recorded has "_1" appended to it. The file name suffix, _1, _2, _3, _4, _5, _6, _7 and _8 always corresponds to tracks L, R, A, B, C, D, E and F . For instance, if track D is the only track recorded, file name suffix will be _6.

Duplicate File Names

When the 788T detects that a duplicate file name is going to be generated in any specific folder, the 788T changes the file name by adding of a letter suffix before the extension. For instance, if take numbers are reset but files are recorded to the same directory as previous files, a suffix "A" is added to the file. If additional duplicate files are generated the letter suffix increments, to B, C, etc.

Appendix D- FAT32 and Maximum File Size

The 788T storage volumes (internal hard drive, CF, external drives) are formatted and write to FAT32 file structures. This structure allows these drives to directly mount in a wide variety of computer platforms, including Windows and Mac OS. Using the FireWire and USB connections, both internal drives (internal hard drive and CF) appear as external FAT32 volumes. FAT32 has a maximum individual file size limitation of 4 GB.

Windows XP has a limitation on FAT32 drive formatting; XP can format a FAT32 volume to a maximum of 32 GB, however it can read FAT32 volumes as large as 2 TB.

Appendix E - Accessories

Several high-value accessories are available for the 788T, including a production case, cables, and power accessories. For a full list of Sound Devices products and accessories, visit our web site **www.sounddevices.com/products**.

Included Accessories

The accessories below are included with the 788T:

- Universal In-Line Power Supply, 100–240 VAC input, 12 VDC, 45 W output
- XL-B2 - Li-ion removable rechargeable battery, 4600 mAh
- XL-RJ - C. Link cable
- CS-MAN - Padded man-bag

Other 788T Related Accessories

CS-4	Production case with high-quality strap for use with the 788T with integrated accessory compartment and NP-type battery compartment. Built for Sound Devices by CamRade.
CS-W	Removable accessory case for the CS-4 Production Case. Designed to hold wireless transmitters and receivers and provides the appropriate cable routing for interconnection of wireless, mixers, and recorders. Built for Sound Devices by CamRade.
CS- MAN	Convenient, padded carry/storage case with handles, handy to store wallets, keys and mobile phones; handcrafted in China.
XL-1B	TA3F to TA3F cable, used to connect the direct outputs of the a Sound Devices 442 mixer to the 788T's analog inputs 5-8, also used to connect analog outputs 1-4 to third-party devices with TA3M inputs.
XL-2	TA3F to XLR-M cable, used to connect analog outputs 1-4, and digital outputs 1-4 to third-party devices with XLR-F inputs.
XL-2F	XLR-F to TA3F cable, used to connect microphones, mixers, and other devices with XLR-M outputs to the 788T analog inputs 5-8.

XL-B2	Removable, rechargeable, Li-ion battery; 7.2 V, 4600 mAh battery; good to have several spares.
XL-BNC	BNC to BNC cable, to connect word clock from external sources to the 788T for synchronizing the 788T; also used to sync external devices from the word clock of the 788T.
XL-DVDRAM	An external bus-powered FireWire DVD Multi-drive. Based on the slot-loading Panasonic UJ-85 drive mechanism, the XL-DVDRAM is used with a 7-Series recorder to record directly to optical disk or as a post-record storage volume.
XL-H	Bare Hirose 4-pin locking DC connector (HR10-7P-4P).
XL-LB2	5-pin LEMO to two (2) BNC cable, used to jam to and from video cameras.
XL-LL	5-pin LEMO to 5-pin LEMO cable, used to connect the 788T time code circuit to Ambient time code sync boxes, slates, and controllers or to jam one 788T to another time code equipped 7-Series recorder; additionally used to jam Aaton cameras from the 788T.
XL-LX	5-pin LEMO to XLR-M and XLR-F cable, used to connect the time code output to SMTPE time code inputs and outputs.
XL-NPH	NP-type battery cup with 12-inch cable terminated in Hirose 4-pin locking DC connector (HR10-7P-4P) at equipment end.

CE Declaration of Conformity

According to ISO/IEC Guide 22
Sound Devices, LLC
300 Wengel Drive
Reedsburg, WI 53959 USA

declares that the product, 788T Professional Digital Audio Recorder is in conformity with and passes:

89/336/EEC	EMC Directive
EN 55103-1, 1997	EMC-Product Family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus for Professional use. Part 1: Emissions
EN 55103-1, 1997	EMC-Product Family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus for Professional use. Part 2: Immunity
CISPR 22, 2006 (EN 55022, 2006)	Radiated Emissions, Class B
CISPR 22, 2006 (EN 55022, 2006)	Conducted Emissions Class B
IEC 61000-3-2, 2005 EN 61000-3-2, 2001	Harmonic Current Emissions (through Amendment 14 of IEC 61000-4-7)
IEC 61000-3-3, 2005 EN 61000-3-3, 2002	Voltage Fluctuation and Flicker
EN 55103-1 Phenomena 2,3, 1997 EN 55103-1	Magnetic Emissions at 1 Meter 50Hz – 50kHz
IEC 61000-4-2, 2001 **EN 61000-4-2, 2001**	ESD, ±4kV Contact, ±8kV Air Discharge
IEC 61000-4-3, 2006 EN 61000-4-3, 2005	Radiated RF Immunity, 3V/m, 80% AM @ 1kHz, 1% step of the previous frequency 80-1000 MHz
IEC 61000-4-4, 2004 **EN 61000-4-4, 2005**	EFT Burst: ±0.5 kV - ±2kV
IEC 61000-4-4, 2004 EN 61000-4-4, 2005	EFT Burst ±0.5kV to ±1kV
IEC 61000-4-5, 2005 EN 61000-4-5, 2001	Surge ±1kV Differential Mode (line to line) ±2kV Common Mode (line to ground)
IEC 61000-4-5, 2005 EN 61000-4-5, 2001	Surge ± 1kV Common Mode
IEC 61000-4-6, 2006 EN 61000-4-6, 2005	Conducted RF Immunity: 3 V 80% AM modulation @ 1kHz
IEC 61000-4-6, 2006 **EN 61000-4-6, 2005**	Conducted RF Immunity: 3 V, 80% AM modulation @ 1kHz
EN 55103-2 Phenomena 3, 1997 EN 55103-2, 1997	Magnetic Immunity 50Hz – 10 KHz
IEC 61000-4-11, 2004 **EN 61000-4-11, 2004**	Voltage Dips and Short Interruptions at test Voltage level: 70%, 40% and 5% nominal for 10ms, 100ms, 1 sec and 5 sec (50Hz)

Tested by L. S. Compliance, Inc. Cedarburg, Wisconsin
April 3, 2008

Matthew Anderson
Director of Engineering
Sound Devices, LLC

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Governing Law

This agreement and limited warranty are governed by the laws of the state of Wisconsin.

Warranty and Technical Support

Warranty & Service

Sound Devices, LLC warrants the 788T Portable Audio Recorder against defects in materials and workmanship for a period of ONE (1) year from date of original retail purchase. This is a non-transferable warranty that extends only to the original purchaser. Sound Devices, LLC will repair or replace the product at its discretion at no charge. Warranty claims due to severe service conditions will be addressed on an individual basis. THE WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE. SOUND DEVICES, LLC DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SOUND DEVICES, LLC IS NOT RESPONSIBLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING FROM ANY BREACH OF WARRANTY OR UNDER ANY OTHER LEGAL THEORY. Because some jurisdictions do not permit the exclusion or limitations set forth above, they may not apply in all cases.

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Sound Devices, LLC
Service Repair RMA #XXXXX
300 Wengel Drive
Reedsburg, WI 53959 USA
telephone: (608) 524-0625

Technical Support / Bug Reports

For technical support and bug reporting on all Sound Devices products contact:

Sound Devices, LLC
E-mail: support@sounddevices.com
web: www.sounddevices.com/contact_support.htm
Telephone: +1 (608) 524-0625 / Toll-Free in the U.S.A.: (800) 505-0625
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Sound Devices hosts a support forum for 7-Series recorders. The URL is:

http://forums.sounddevices.com

Sound Devices cannot guarantee that a given computer, software, or operating system configuration can be used satisfactorily with the 788T based exclusively on the fact that it meets our minimum system requirements.

Please check with your software editing application to make certain that it is compatible with the file type selected.

SOUND DEVICES

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